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THE CAUSATION AND CURABILITY OF CERTAIN LONG-STANDING ALBUMINURIAS *

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During the past few years a number of cases of albuminuria have come to my notice in which investigation showed the existence of a local focus, the removal of which led to the disappearance of the albuminuria. Thanks to the work of Billings and his school, we know the importance of foci of infection in the production of systemic disease. It is of interest to note that as early as 1802 Benjamin Rush pointed out in a letter the relation between systemic disease and caries and abscess of the teeth.

That severe local infections, such as ulcerative endocarditis, tonsillitis, and, indeed, most other acute infections, are capable of producing nephritis of the parenchymatous type, is of course a long-established fact. With this form of nephritis, which is an immediate result of the acute toxemia, I am not dealing. The type to which I desire to call attention is entirely devoid of acute features, and has all the earmarks of chronic renal disease. We know how futile is the attempt in the majority of such cases to remove the albumin from the urine by means of drugs or by diet.

These insidious albuminurias are often found in apparently healthy men who, in full confidence, apply for life insurance, only to be refused temporarily or permanently, because of the trace of albumin in the urine. Among adolescent subjects some cases have been classed as cyclic, orthostatic or postural albuminuria, a condition that as yet has no very satisfactory explanation. These cases are rather easily recognized. They give, as Barker and Smith[1] have shown, normal phenolsulphonephthalein outputs, and in other ways behave as cases of a nonprogressive type of renal irritation. Apparently the worst that can be said of them is that they bar the patient from life insurance.

While many cases of albuminuria of slight degree and springing from no obvious cause are due to early interstitial nephritis, there are some in which a careful search reveals a disease focus that stands in etiologic relation to the albuminuria. Let me illustrate this by a few examples:

CASE 1.—J. J. H., a boy, aged 9 years, came under my care because of poor and capricious appetite and general lack of vitality. He had been a difficult "feeding case" as an infant, but had not had any special diseases. From birth he was sensitive to protein, particularly egg protein, which caused hives, as his mother said, "almost before he swallowed it." Once he passed a little gravel. The tonsils and the cervical glands were enlarged, but the boy was not a mouth breather. There was also some enlargement of the spleen. The urine was very scanty, and for a year or more had contained a small amount of albumin and occasionally hyaline and granular casts. There was no edema. All manner of treatment was tried without producing any marked changes in the urine either in quantity or in quality.

Although the boy had never had a genuine attack of tonsillitis, I thought it best to have the tonsils removed, since they looked unhealthy. They were extirpated under ether, April 1, 1913, nearly two years after the discovery of the albuminuria. Both tonsils were found to contain cheesy masses, and in one there was an abscess. There was also a large adenoid. The second specimen of urine examined after the operation was free from albumin. Then, for a little while traces reappeared; but at the end of about six months both albumin and casts had entirely vanished. The appetite at present leaves nothing to be desired, and the lad is one of the finest and most agile of his age.

CASE 2.—A man, aged 42, a veterinary surgeon, came under my observation in 1913, stating that for years he had had pain in the right lower abdomen, which had sometimes been looked on as appendicitis, sometimes as renal colic. He had never passed blood or gravel, and only once—for about a week in 1911—he had passed pus. He had become more or less reconciled to the diagnosis, made by many medical examiners, of Bright's disease. The urine showed, when I examined it, just as it had done for many years, a small amount of albumin. Jan. 20, 1913, after the confirmative evidence of a roentgen-ray examination, a successful operation for the removal of a stone was performed by Dr. B. A. Thomas. The albumin disappeared quite promptly. When I last saw the patient, he seemed to be entirely well.

CASE 3.—A man, aged 21, a college student, was sent to me by Dr. W. P. Walker of South Bethlehem, because of albuminuria, which had been discovered during an examination for life insurance. Since 1909 the boy had had four sharp attacks of tonsillitis, notwithstanding the fact that he had had an operation for adenoids and enlarged tonsils in 1907. He had passed through measles, chickenpox and whooping cough in early life. The urine had a specific gravity of from 1.016 to 1.024, and contained albumin and sparse hyaline casts and occasional red blood cells. His blood pressure was 120 systolic and 80 diastolic; the weight was 109 pounds. The phenolsulphonephthalein test showed 53 per cent. in the first two hours and 15 per cent. in the third hour. The onset of elimination was somewhat delayed, requiring twenty minutes. The quantity of urine was about normal. While at Yale he was seen by Dr. Tileston, and on one occasion by Dr. Pratt of Boston. Both found the condition that I have described.

In June, 1914, the young man, with a number of other students, fell ill with sore throat, after eating in a certain restaurant. Feeling better at the end of twenty-four hours, he went to his home in Bethlehem, where he immediately had a relapse. The throat was intensely inflamed, and on the swollen tonsils there were discovered follicular spots, as well as areas of whitish exudate. The patient was extremely weak and prostrated, and had great difficulty in swallowing.

* Read at the meeting of the Association of American Physicians, Atlantic City, May 3, 1917.

1. Barker and Smith: Am. Jour. Med. Sc., 1916, **151**, 44.

I saw him with Dr. Butler, and felt sure that he had streptococcic sore throat. After his recovery, which ensued without serious interruption, the tonsils, from which he had suffered so much during the preceding four or five years, were thoroughly extirpated. The albumin disappeared from the urine thereafter, and the last account I had from the young man was that he was perfectly well.

When, on one occasion, I discussed the subject of albuminuria due to focal conditions with Dr. B. A. Thomas, he told me that he could supply me with the histories of several striking cases. He has been kind enough to do so, and I copy one:

CASE 4.—A man, aged 22, consulted Dr. J. C. Birdsall, Dr. Thomas' assistant, Feb. 15, 1915, because of albuminuria discovered, Jan. 1, 1914, during examination for life insurance. The urine showed a light cloud of albumin but no tube casts. Examination of the pharynx revealed diseased tonsils. A tonsillectomy was advised, which was done during the summer of 1915. October 9, the urine still showed a cloud of albumin. December 17, the patient suffered an attack of bronchitis. Sputum culture revealed the pneumococcus and the *Staphylococcus albus*. An autogenous bacterin was prepared, of which the patient received a number of injections. The urine was examined several times during the next two months, and on every occasion was found free of albumin.

Dr. Thomas also tells me that he has seen a number of instances of chronic albuminuria in syphilitic patients in whom the albuminuria entirely disappeared after antisyphilitic treatment.

The point that I desire to bring out is that cases of long-standing but otherwise mild albuminuria should not be looked on as incurable, unless evidence on the part of the cardiovascular system, or testimony given by functional tests, clearly demonstrates that the kidneys are diseased. This applies also to the so-called orthostatic or postural albuminurias of adolescents. The albuminuria may be kept up by disease of the tonsils (which is not always discoverable by simple inspection), by dental abscesses, by other infective foci, or by the presence of a stone. It may be made to disappear entirely, at least in some cases, by the removal of the offending focus. This gratifying result does not always set in immediately, but sometimes only after a number of months. The physician, therefore, should not be too soon discouraged. It is probable that kidneys which have been for a long time the seat of slight irritation will always be somewhat sensitive, whence it follows that patients cured of albuminuria should remain under medical observation for a number of years.

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Automobile Accidents in New York.—In a statement issued by State Commissioner of Health Herman M. Biggs an interesting and significant comparison is made between the number of deaths in the state caused by automobile accidents and typhoid fever, as well as other causes of death. While typhoid fever mortality was reduced 26 per cent. in 1917, the deaths from automobile accidents increased so much as to take the place of typhoid fever as one of the principal preventable causes of death. In September, 1917, there were 155 deaths from automobile accidents, more than the combined mortality from homicide and suicide, and undoubtedly a much greater number of injuries involving prolonged illness and more or less permanent disability. Of these deaths 55 were in New York City, 63 in upstate cities and 37 in rural districts. Typhoid fever caused 84 deaths among 796 patients during September. For the year 1917, up to September 30 there were 755 deaths from automobile accidents, while for typhoid fever there were 434 deaths among 2,840 patients.—*Bulletin* New York State Department of Health.

THE USE OF BISMUTH IODOFORM PASTE IN OUTPATIENT WORK*

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The treatment of postoperative hospital cases, as well as that of minor surgical conditions, comprises the general function of the routine work in the outpatient departments of our larger hospitals.

The chronically obstinate sinuses of osteomyelitis, tuberculosis, fecal fistula, empyema, lung abscess cavities and innumerable similar conditions present problems of no small importance to the outpatient surgeon who must receive the convalescent patient on his discharge from the hospital ward and take over the problem of promoting a rapid and complete recovery.

Another difficulty with which the outpatient surgeon has to deal is the indifference and the neglect of the patient to return regularly for treatment.

It was the hope of obtaining better results than with the means commonly employed that led us to use bismuth iodoform paste, first described and used by Rutherford Morison[1] in the treatment of war wounds at the Northumberland War Hospital, England.

In our work we have used two preparations of bismuth iodoform paste, the original paste and an emulsion.

The paste is prepared according to the formula of Morison. It is composed of bismuth subcarbonate or subnitrate, 1 part, iodoform, 2 parts, and liquid petrolatum, 1 part. We devised the emulsion because of the difficulty of introducing the paste into deeper cavities which necessitated drainage through a narrow sinus. This emulsion, which we have called "liquid bipp" (bismuth iodoform petrolatum paste), is composed of bismuth subcarbonate, 1 part, iodoform, 2 parts, and liquid petrolatum, 4 parts. Both preparations are easily and cheaply prepared.

Our treatment of highly infected wounds has been identical with that described in the British war hospital. The wound is first thoroughly irrigated with sterile saline, or 1:25 boric acid solution. It is then liberally swabbed out with 75 per cent. alcohol. The surrounding skin is shaved and cleansed in the same manner. The wound with all its cavities and pockets is tightly packed with bismuth iodoform paste and closed with the usual silkworm-gut or silk sutures.

The type of cases in which the foregoing has been employed has included only those in which we had previously allowed the wounds to heal by second intention or had drained them with rubber tissue. In the case of the majority of the patients treated with bismuth iodoform paste, the wound healed by first intention, with no resultant sinus, leaving a clear-cut insignificant scar. In highly infected cases, healing was effected by rapid granulation from the bottom.

In two patients with tuberculous cervical adenitis in which suppurating glands were removed from tissue that was thoroughly necrotic, curettage, swabbing with alcohol, and packing with bismuth iodoform paste were followed by complete closure. There was healing by first intention and recovery without sinus formation. We report this because in similar cases

* From the Surgical Outpatient Department, Peter Bent Brigham Hospital.

1. Morison, Rutherford: Lancet, London, 1916, **2**, 268-272.

it had previously been our custom to employ drainage. The resultant sinus healed by second intention only after many days, and was complicated by excessive granulations.

As to the relative value of bismuth iodoform paste and Beck's paste in the treatment of osteomyelitic sinuses, it is as yet too early to make an accurate or fair comparison. We have convinced ourselves, however, that the injection of the liquid bismuth iodoform mixture, accompanied by the maintenance of proper drainage, has thus far been more satisfactory than any of the older methods of treatment.

The results obtained in the postoperative treatment of a large number of empyema and lung abscess cavities have been extremely encouraging.

In these cases the sinus is completely filled with the liquid bismuth iodoform mixture by instillation with a large glass syringe through the rubber drainage tube. In this way the cavity and sinus are both completely filled with the emulsion, and the drainage tube remains in situ. It is not necessary for the patient to present himself for another dressing for from three to five days.

We have succeeded in obtaining a complete healing in four chronic cases which had obstinately resisted all other methods of treatment during a long period of time. More than half of the recently operated on patients that were given this treatment have progressed at a more rapid and satisfactory rate than prevailed under older methods of treatment.

A decided advantage of this paste is its nontoxicity even when it is used in large quantities. The possible dangers arising from the use of large amounts of iodoform and bismuth are iodoform poisoning and poisoning from lead which may be present in impure bismuth carbonate or subnitrate. Morison[2] asserts that in his entire series he has had only two patients in whom symptoms of poisoning by either of these drugs were severe enough to demand removal of the paste from the wound.

To prevent the introduction of lead into the wound, each batch of the bismuth salt is first tested for the presence of lead before it is incorporated into the paste.

Hepworth[3] reports five cases of poisoning occurring in the Wharncliffe War Hospital, Sheffield, in which symptoms suggesting plumbism were present. He describes a simple and yet delicate test for the presence of lead which we have used in our work with the greatest satisfaction.

We have been constantly on the watch for any symptoms of poisoning. Thus far we have had only one patient, with a large empyema cavity, in whom there was a blue line localized on the gums about the two canine and the two incisor teeth of the lower jaw. A piece of the bluish red gum was excised and studied microscopically and chemically. Chemical tests for both bismuth and lead were negative. Microscopically, the pigment was found in the layers of the rete. A definite decision as to whether the substance was lead or bismuth sulphite was not made. Since the patient had absolutely no untoward symptoms, the treatment was continued, careful observation being made at each visit. The red blood cells have shown no change, and the urine has not contained bismuth. The empyema cavity is healing rapidly from the bottom.

2. Morison, Rutherford: Brit. Jour. Surg., 1917, **4**, 659-678.
3. Hepworth, F. A.: Lancet, London, 1917, **1**, 573-574.

CONCLUSIONS

The advantages of bismuth iodoform paste lie in its marked germicidal action and stimulation of rapid tissue growth.

It is cheaply and easily prepared, is nontoxic, and requires no great skill in application.

An added feature in outpatient work is that less frequent dressings are necessary and therefore require a decreased number of visits per patient. This is often an economic saving of no small importance to the laboring patient.

The object of this article is to draw the attention of other outpatient departments to this preparation as a valuable addition in the treatment of similar cases in civil practice.

OPERATIVE RISK IN CARDIAC DISEASE *

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General impressions of operative risk in cardiac disease are scattered throughout medical literature, but we have been unable to find any summary of results in a given series of cases. The failure to report such results must be due largely to two reasons: first, the difficulty of accurately classifying cardiopaths into similar groups, and second, the fact that in ordinary work few observers have an opportunity to study any series of such patients needing surgical treatment. These reasons are sufficient to make us feel some temerity in reporting a series of such cases, and yet we feel that such a report may throw some light on the subject.

Experience here has taught us that the best measure of operative risk in cardiac disease is a good clinical impression of the patient's ability to stand physical strain, in addition, of course, to a good history and a physical examination. Cases in which the heart permits the patient to go about, or in which it can be sufficiently restored by treatment to allow this, usually have been considered safe for operation. The "goiter heart," the "fibroid heart," the "prostate heart," etc., are often so remarkably improved following operation as fully to justify the risk. Cardiac disease due to focal infection, particularly tonsillitis and rheumatism, often shows the same happy result following the removal of the focus. A malignant condition complicating heart disease is considered operable if a fair hope of cure is offered, and palliative operations are often indicated in such cases. In very few instances in which there has been urgent need of operation has it been refused on account of the cardiac condition, though in many, the operation has been undertaken only after preliminary medical treatment. The decision in each case is based on several factors: (1) the immediate operative risk; (2) the probable improvement of the condition of the heart following the operation; (3) the patient's relative chance for length of life or general health with and without the operation, and (4) in less serious conditions whether the operative relief will justify the increased risk.

* From the Mayo Clinic.

Our experience in general has justified the taking of risks in cases demanding surgical intervention.

A rational classification of cardiac risks on a basis of valvular disease alone is impossible. Valvular disease, with myocardial compensation sufficient to allow marked exertion, does not increase operative risk. With reasonably good compensation, allowing moderate exertion with comfort, the risk is not greatly increased, that is, a mitral stenosis may be slight and not increase the risk. With moderately good compensation the risk is not great, whereas with a very badly damaged myocardium it may be greatly increased. Similarly an aortic lesion without cardiac symptoms is easily operable, whereas the heart would not be considered operable if there was marked angina associated with the lesion. Manifestly the presence of valvular disease alone gives a poor basis for grouping similar cases.

A classification based on attempts to measure the cardiac reserve is also impossible since we have no accurate means of measuring it, and clinical impressions are variable. Angina pectoris, aortic valvular disease with pain, and aortitis with dilated aorta are universally recognized as marked contraindications to operative interference; but the risk in such cases is variable, and so few patients have been operated on that a correct statement of the risk is impossible.

Recent advances in cardiac study, particularly of the electrocardiograph, have given opportunity for better classification. We have studied results in four groups of cases of disordered cardiac mechanism that are universally recognized as bad risks—the worst groups of risks, if we except angina pectoris and allied conditions. These groups are: (1) auricular fibrillation; (2) auricular flutter; (3) impaired auriculoventricular conduction, and (4) impaired intraventricular conduction. No clinician will take exception to the statement that these disorders include the worst of cardiac risks; they give definite objective findings and are accompanied usually by extensive myocardial damage. A history showing any such cardiac disorder should always be very carefully considered.

We did not have an opportunity to examine before operation all the patients having cardiac trouble, and therefore selected only those who had had electrocardiograms taken since August, 1914. These represent the larger number of surgical cases in which cardiac disease was a complication. Undoubtedly a few patients were so obviously in a bad condition that the clinician did not consider a complete examination necessary (that is, an electrocardiogram) and sent them home. If moribund patients and those bedridden by heart disease are excepted, our summary is a fair average of patients in whom cardiac operative risk is necessarily gravely considered. As we have mentioned, angina pectoris has not been included in the series because no evident grounds for grouping similar cases are apparent, and patients suffering severely from the condition are rarely considered operable.

AURICULAR FIBRILLATION

The mechanism of this disorder is now known to be rapid incoordinate contractions of individual muscle-bundles of the auricular wall, that is, fibrillary twitchings, descriptively called "fibrillation." The auricle loses its pumping function and becomes a dilated organ, acting only as a reservoir in the circulation. The condition is characterized in the larger number of cases by a totally arrhythmic pulse and often by a marked tachycardia. Usually fibrillation is a permanent cardiac disorder, though in a definite percentage of cases it is paroxysmal, with an established sinus rhythm between attacks.

Exophthalmic Goiter.—Extensive experience with hyperplastic toxic (exophthalmic) goiter makes it evident that fibrillation is an end-result of the disease toxin on the myocardium. The fibrillation is found in young patients when the toxemia is severe and has continued a long time. It is usually much less frequent under than above the age of 40.

We have recorded nine patients under 30 years of age, the youngest 21, and twelve between 30 and 40 years of age, a total of twenty-one patients under 40 years. This group comprises the worst risks. Usually the myocardiums of young patients stand the strain well; yet they have given out, and this is evidence of extreme toxemia and stress. A high mortality should be expected. One patient died following a Porter hot water injection; three died in from four to six weeks at home (reported as one cardiac death, two due to pneumonia); two died eight and fifteen months following thyroidectomy; that is, six of twenty-one patients died within fifteen months. We have recently heard from eleven of the fifteen remaining patients. Five report that they are almost or completely well, and six report definite to marked improvement. To recapitulate: Of twenty-one patients under 40 years of age with fibrillation due to exophthalmic goiter, one third are well, one third are improved definitely to markedly, and one third are dead.

In older patients (more than 40 years old) it is expected that the myocardium will break down more easily, and that it will show poorer recuperative power. We have recorded forty-nine patients more than 40 years of age with fibrillation, and have recently heard from twenty-one of them. Three are dead, one being an operative mortality, one dying six years after thyroidectomy and fifteen months after a radical operation on the breast for carcinoma (fibrillation clinically eleven years), and one dying in nine months from "heart failure." Eighteen of the series report as follows: Thirteen are much or completely relieved of cardiac symptoms, four are definitely improved though still cardiopaths, and one reports questionable improvement.

The gross operative mortality of seventy cases of fibrillation associated with exophthalmic goiter is two deaths, or 2.8 per cent., which compares very favorably with the present normal operative mortality of 2.6 per cent.

Thyrotoxic Adenomas.—This group represents the typical *Kropfherz* of Kocher, the "goiter heart." Clinical observation has long shown that certain patients with "simple goiter" after years of good health gradually develop thyrotoxic symptoms and cardiac disease. A considerable percentage of such patients later show auricular fibrillation; in seventeen cases of fibrillation there was one operative death, and two deaths in nine and twenty-three months, respectively. Seven other patients have been heard from; four are almost or completely well, two are definitely improved, and one is questionably improved.

Work on basal metabolism has shown that these patients have a constantly high metabolic rate, comparable to that of typical exophthalmic goiter. This, with the similar myocardial damage and the remarkable cardiac improvement in most cases after opera-

tion, makes the operative risk well worth while, and much smaller than is generally believed.

Other Diseases.—There were nine cases of fibrillation in patients less than 40 years of age and sixteen more than 40, making a total of twenty-five. The operations have been as follows: nine tonsillectomies, four excisions of epitheliomas (two lower lip, one gland of the neck, one larynx), one excision of a gland of the neck for diagnosis (sarcoma), three cholecystectomies and appendectomies, three gastro-enterostomies, two for ulcer, one for carcinomatous obstruction, one Talma-Morrison, one herniotomy, one cataract extraction, one suprapubic stab, and one cauterization of urethral caruncle. There were two early fatalities, one a postoperative death due to decompensation in the case of suprapubic stab, and one from cholangeitis following a gallbladder operation. One patient died a cardiac death nine months after tonsillectomy. Three others are dead, one death being reported as due to paralysis, one as due to peritonitis, and one as due to sarcoma. This makes six deaths in the twenty-five cases, only two of which were due to the cardiac condition. In recent reports from eleven patients, all but one say they are definitely to markedly improved as regards the cardiac complaint. The patients who had tonsillectomies seem to have done particularly well.

AURICULAR FLUTTER

This disordered cardiac mechanism is recognized as due to the rapid coordinate contractions of the auricles, stimulated by foci of irritation located in the auricular wall outside the normal pacemaker. The auricles contract at a rate of 200 to 380 and the ventricles usually at one half the auricular rate, though any rhythm from a 1:1 association to complete heart block may exist. The pulse is regular in one half of the reported cases and grossly irregular in the other half. The degree of block may vary from time to time, and most patients are subject to paroxysmal "weak spells," owing to a sudden decrease in the degree of block allowing the ventricles to assume the full auricular rate. The condition is usually chronic, and may exist for years. A "weak spell" during the operation is an evident danger, though we have not observed it. Four patients have been operated on, all included in the foregoing under fibrillation. These patients are of particular interest as apparently being the first proved cases of flutter in which an operation has been done.

We have reported elsewhere[1] that these four patients were subjected to vigorous digitalis and rest treatment until fibrillation was brought on and then the operation was done. Three of the patients had exophthalmic goiter, though one had a cholecystectomy and tonsillectomy in the clinic, and a thyroidectomy elsewhere later. One other patient had had a tonsillectomy. All the patients with exophthalmic goiter resumed a normal rhythm after the operation, and two had no cardiac symptoms. The last patient (tonsillectomy) reports himself greatly improved. Thus far, there has been no mortality.

PARTIAL OR COMPLETE HEART BLOCK

One patient with complete block has had three operations in eleven years—appendicectomy, amputation of breast for carcinoma, and excision of recurring skin nodules. The cardiogram was taken before the last operation, but the pulse was remarkably slow at the former examinations. The patient is alive and reasonably well. Six patients showing delayed conduction-time between auricles and ventricles, that is, auriculoventricular intervals of from 0.22 to 0.28 second, have been operated on as follows: three for diseased tonsils, one for exophthalmic goiter, one for thyrotoxic adenoma, and one for gallbladder disease. Thus far, we have no knowledge of a death in these cases. Four of the patients recently reported that they are markedly improved or cured.

INTRAVENTRICULAR BLOCK

This disorder is due to impaired conduction of the cardiac impulse after it has passed the bifurcation of the auriculoventricular bundle. It is evidence of disease in the main branches of the bundle or in the subendocardial plexus, causing a slow and ununiform diffusion of the contraction stimulus throughout the ventricular wall. Recently Oppenheimer and Rothschild[2] have excellently presented this subject and have called attention to the serious cardiac damage and the early fatality which it usually indicates. As a basis for clinical interpretation we have used for several years the same criteria which they present, and we are able to confirm their general findings in a larger series of cases (158).

The electrocardiographic curve in this condition shows a prolonged QRS complex (active ventricular phase), and variations of this up to the remarkable complexes which have been described as branch bundle defects. Undoubtedly such curves indicate extremely bad myocardial damage, as may be readily determined by ordinary clinical methods.

Relief of a probable infectious or toxic focus for the cardiac disease has seemed advisable, and operations have been done with this in view. Twelve patients have been operated on: seven tonsillectomies, four thyroidectomies (three exophthalmic goiter and one thyrotoxic adenoma), one ligation for exophthalmic goiter, and one salpingectomy. Six of the seven tonsillectomy cases had histories of rheumatic fever. One patient died of cardiac insufficiency one year after tonsillectomy; seven others (five with definite valvular disease) report definite to marked improvement in general health. It would seem, therefore, in such cases that if a surgical condition appears as a cause or aggravation of the cardiac disease, operation should be undertaken, particularly if goiter or tonsillitis is the disturbing condition. Five of our patients were 30 years of age and two were younger, and improvement is greatly desired for such young patients.

SUMMARY

We do not believe that valvular disease with good or reasonably good compensation should be considered as a contraindication to operation, because the surgical risk is not materially increased in such cases. Careful anesthesia is, of course, essential. In the Mayo Clinic, the record of 120,000 ether anesthesias with but one death under anesthesia is evidence of the remarkable safety of ether when properly administered.

The best idea of the cardiac risk in surgical cases is derived from a carefully balanced impression of the patient's general ability to stand stress. If the patient is ambulatory without marked decompensation, opera-

1. Blackford, J. M., and Willius, F. A.: Auricular Flutter, to be published.

2. Oppenheimer, B. S., and Rothschild, M. A.: Electrocardiographic Changes Associated with Myocardial Involvement, THE JOURNAL A. M. A., Aug. 11, 1917, pp. 429-431.

tion is usually safe. If marked cardiac insufficiency is evident, the patient should be medically treated until a fair degree of compensation is restored.

Surgical intervention should not be undertaken in a cardiopath unless there is definite reason to believe that the surgical relief is essential to reasonable health or will improve the cardiac condition. "Meddlesome surgery" has a fuller meaning in treating cardiopaths.

Extremely severe cardiac disease can often be definitely to completely relieved by the removal of an infectious, mechanical or toxic source of cardiac strain or degeneration. In cardiopaths suffering from goiter the relief is often beyond all expectations. Not infrequently in such cases patients are transformed from confirmed invalids to active, useful persons.

Of one hundred patients operated on with auricular fibrillation, there was a gross surgical mortality of 5 per cent.; but in only 3 per cent. death was due to cardiac disease. That is to say, 3 per cent. represents the increased risk in one hundred patients. Thirteen per cent. have died since leaving the clinic. Forty-seven others report as follows: Eight are subjectively well, twenty are markedly improved and able to lead fairly active lives, sixteen are definitely improved but still obliged to avoid exertion, and three report little or no improvement.

Four patients with auricular flutter were operated on after fibrillation was brought on by treatment. Two are subjectively well, and two are markedly improved.

Seven patients with partial or complete heart block (six partial, one complete) were operated on, with no deaths. Three of the patients are markedly relieved, and one is unaware of cardiac difficulty at present. The complete block is unchanged.

Twelve patients with intraventricular block were operated on, with the result that one died a year following tonsillectomy, and seven report definite to marked improvement, in spite of evident valvular disease.

We wish to emphasize the fact that these results are given with the belief that they represent what are usually considered the worst surgical cardiopathic risks (except angina and allied conditions). With few exceptions they include all cases of bad cardiac disease in the clinic that needed surgical treatment.

Myocardial insufficiency finally reaches a point at which there is no possibility of improvement with any method of treatment with which we are familiar. We know only of the therapeutic test to determine this point in doubtful cases, and the foregoing results show that until such a stage of decompensation is reached the patient should at least be given the chance of surgery. The improvement following surgical interference in suitable cases has been so remarkable as fully to justify accepting the samewhat increased risk. The general tendency unquestionably is to overestimate the danger of operative fatality. In cases in which surgery can relieve, cardiopaths should not be refused operation, at least until a therapeutic trial has been given for the reestablishment of some compensation.

Patients with arrhythmia, particularly fibrillation, stand operation remarkably well after medical treatment. It may be said that the fibrillating auricle has whipped the ventricle until continued ventricular action proves a reasonably good ventricular power, and life depends on ventricular, not auricular, action. Our ability to estimate operative risk depends on our ability to estimate the ventricular reserve, and remarkably little reserve seems necessary to carry the patient through good ether anesthesia. That we may err in judgment is evidenced by our three cardiac surgical deaths, and eight other deaths within a year from cardiac insufficiency. However, the general results of definite to marked improvement in about 80 per cent. of suitable cases is ample justification for accepting the increased mortality.

From the foregoing study we seem justified in making the following definite conclusions: first, that many properly selected cardiopaths, often considered hopeless, may be relieved by surgical measures, and second, that the general tendency at present is to require too great a margin of cardiac safety in surgical work.

THE BRUCK PRECIPITATION TEST FOR SYPHILIS

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Since the adoption of the complicated complement fixation test for syphilis, repeated attempts have been made to simplify it or to substitute for it a simple chemical test. Most of these substitute tests have been precipitation tests, and so far all have failed to attain any practical degree of diagnostic accuracy. Bruck,[1] the collaborator of Wassermann on the complement fixation test, has recently brought out another, for which he claims specificity. Since the war began he has continued his research under the restricted facilities of a field hospital, and found that the nitric acid precipitate in syphilitic serum dissolved more slowly on neutralization with alkalis, than the precipitate in normal serum. He then sought the quantity of distilled water necessary to dissolve the normal precipitate without dissolving that in syphilitic serum. The test thus evolved has given good results in his hands, and he suggests that it be tried out by other experienced laboratory workers in the hope that it may be of use in diagnosis or at least may shed further light on the character of syphilitic serum. He suggests that it may be of especial value to the military surgeon unable to obtain the help of the Wassermann reaction, in determining whether or not it is necessary to send certain patients back from the front for antisyphilitic treatment. In view of the needs of the approaching time of demobilization of the troops, he suggests that any additional aid to the diagnosis of syphilis will be welcome.

As a reagent he uses the acidum nitricum purum of the German pharmacopeia, which is about 25 per cent. nitric acid with a specific gravity of 1.149. Five-tenths c.c. of clear serum is put into a large test tube, 2 c.c. of distilled water added, and the tube shaken. Then, the exact time being noted, exactly 0.3 c.c. of the reagent is added, the tube again shaken, and allowed to stand ten minutes at room temperature. To the white precipitate thus formed, 16 c.c. of distilled water are then added, and the tube, capped by the finger, is carefully inverted three times, the formation of froth being avoided. Again the tube is allowed to stand ten minutes and then inverted three times in the same way, froth formation always being avoided.

1. Bruck, C.: Eine sero-chemische Reaktion bei Syphilis, München. med. Wchnschr., 1917, **64**, 25.

After the tube has stood for half an hour at room temperature, the reaction may be read. All tubes showing more than slight opalescence are read as positive, all tubes with clear contents as negative. The author suggests that the reading is easier if the tubes are allowed to stand twelve hours, when the precipitate will be seen at the bottom. The tubes then showing only a slight precipitate, *kleine kuppe*, are to be read as doubtful or negative. The necessity of accuracy in measurement of the reagent, and in timing the various parts of the reaction is emphasized.

In about 200 syphilitic serums there was practically complete agreement with the Wassermann reaction. Only three Wassermann positive serums, from one latent and two secondary cases, gave negative Bruck reactions. On the other hand, one case of congenital syphilis and one tertiary case gave positive Bruck reactions, although the Wassermann test was negative. Of about 200 nonsyphilitics, all were negative except four cases of old infected wounds of knee and thigh, long febrile, and one febrile case of tuberculosis. A positive test in a febrile case, therefore, is not trustworthy.

Bruck does not put forward his test as a substitute for the Wassermann reaction, but thinks that it may possibly be due to the same peculiarity of syphilitic serum responsible for the Wassermann reaction, and that it may be useful in connection with the latter. If it proves a practical aid to diagnosis, it has the great advantages of requiring only a simple laboratory outfit, a single stable reagent, and little time.

I have performed the new test under the conditions prescribed by the author in 209 cases. In fifty-three of these, more than 25 per cent., the results disagreed with those of the Wassermann reaction. In thirteen cases of active early syphilis, in all of which the Wassermann reaction was very strongly positive, the new test was negative. On the other hand, 24 per cent. of seventy-four nonsyphilitics gave positive Bruck reactions. These occurred in one febrile case of septicemia and in sixteen afebrile cases, one of gonorrheal urethritis, one of gonorrheal arthritis, one of xanthoma planum et tuberosum, one of systemic blastomycosis, one of dermatitis venenata, and in one healthy man, three nursing women and eight pregnant women, apparently healthy.

COMPARATIVE RESULTS OF TESTS

Diagnosis	No. of Cases	Positive Wassermann Reactions Per Cent.	Positive Bruck Reactions Per Cent.
Early active syphilis	31	100	58
Late active syphilis	12	92	58
Latent syphilis	54	67	20
Nonsyphilitic	74	0	24

Bruck states that either active or inactivated serum may be used for the test. In 115 cases in which I have performed the reaction with both active and inactivated serum, the result was the same in ninety-eight cases, but differed in seventeen. In fourteen cases the active serum gave a positive reaction, the inactivated a negative, while in three cases the reverse occurred. That these differences were not all accidental, from slight differences in technic such as Smith and Solomon[2] have shown to be important, was indicated by the fact that repetition of these tests in many instances gave exactly the same result. The only departure from the original technic as published by Bruck was that the tubes were allowed to stand over night, from eighteen to twenty hours, before being read. Attempts to read them within a few hours were discontinued as valueless, for it was impossible to say which tubes would give a precipitate and which would not. The author of the test himself advises that they be allowed to stand twelve hours before being read. In every other respect the technic as given by Bruck has been carefully followed.

Since this paper was begun, Smith and Solomon[2] have reported their results in a series of 400 cases. They insist on several refinements of technic omitted by the originator of the test; but in spite of their use of these, their results disagreed with those of the Wassermann reaction in 25 per cent. of the cases, and in 302 nonsyphilitics they had 28 per cent. of doubtful or positive reactions. In syphilis of the central nervous system their Bruck reaction differed from the Wassermann in only ten of sixty-nine cases, or 14 per cent. In twenty-two other syphilitics the two reactions differed five times, or 23 per cent. These are better results than I obtained in my series of ninety-seven syphilitics in all stages, for I had 35 per cent. disagreements with the Wassermann reaction, in nearly all of which the Wassermann was correct. On our whole series we agree in having had disagreement between the two reactions in 25 per cent. of cases.

The new reaction in my hands was remarkably weak in early, untreated syphilis, giving negative reactions so often as to make it useless for the diagnosis of this class of cases. To make certain that there was no mistake about the negative Bruck reaction in these cases, I repeated the tests in many of the cases, always with the same result. When this is considered along with 24 per cent. of positive reactions in nonsyphilitics, which were also carefully checked by repetition, the uselessness of the test for diagnostic purposes is apparent.

That syphilitic serum differs from most other serum in regard to the ease with which it can be precipitated has been shown in many ways since Fornet and Schereschewsky,[3] in 1907, proposed a ring test for syphilis, made by overlaying the serum in a case of tabes or paresis with the serum in a case of early syphilis. At the line of contact between the two serums, a ring of precipitate appears. Michaelis and Citron showed that mixture of syphilitic serum with extract of syphilitic liver produces a precipitate. Porges and Meier[4] devised a precipitation test by the use of an emulsion of lecithin as reagent. Klausner offered a test consisting of the dilution of active serum with distilled water, giving a precipitate in twenty-four hours in case the serum is syphilitic. Elias, Neubauer, Porges and Salomon[5] used sodium glycocholate as the precipitating reagent. To this Herman and Perutz later added cholesterin in a vain effort to perfect the reaction for diagnosis.

The Bruck nitric acid precipitation test seems destined to take its place beside these. In fact, the results obtained by Fritz and Kren[6] in their trial of the lecithin and sodium glycocholate tests were not very different from the results of the Bruck test. In a

2. Smith, C. E., and Solomon, H. C.: The Bruck Sero-Chemical Test for Syphilis, Boston Med. and Surg. Jour., 1917, **177**, 321.

3. Fornet and Schereschewsky: Serodiagnose bei Lues, Tabes und Paralyse durch specifische Niederschläge, Deutsch. med. Wchnschr., 1907, **33**, 1679.

4. Porges, O., and Meier, G.: Ueber die Rolle der Lipoide bei der Wassermann'schen Syphilis Reaktion, Berl. klin. Wchnschr., 1908, **45**, 731.

5. Elias, Neubauer, Porges and Salomon: Wien. klin. Wchnschr., 1908, **21**, 376.

6. Fritz, W., and Kren, O.: Ueber den Wert der Serumreaktion bei Syphilis nach Porges-Meier und Klausner, Wien. klin. Wchnschr., 1908, **21**, 386.

series of fifty-nine syphilitics, they obtained with the lecithin test 63 per cent. positive reactions, and in twenty-four nonsyphilitics, 50 per cent. positive reactions. With sodium glycocholate there were 65 per cent. positives in syphilitics and only 17 per cent. positives in nonsyphilitics. All the precipitation reactions show in a large proportion of syphilitics an increased amount of some substance which, however, is also present in like amount in a smaller proportion of nonsyphilitics. The fixation of complement by the combined action of syphilitic serum and extract of liver or heart remains the only property of syphilitic serum thus far discovered that is not shared by so large a percentage of nonsyphilitics as to preclude its use for diagnosis.

CONCLUSIONS

1. The Bruck precipitation test for syphilis fails in a considerable percentage of early secondary syphilis.

2. It gives positive reactions in from 24 to 28 per cent. of nonsyphilitics.

THE PHARMACOLOGY OF THE OIL OF CHENOPODIUM

WITH SUGGESTIONS FOR THE PREVENTION AND TREATMENT OF POISONING *

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The oil of chenopodium is an essential oil which is distilled from American wormseed or Jerusalem oak, a weed quite common in Maryland and in the states farther south. It first came into use in therapeutics in the treatment of ascariasis, but in recent years it has also become the chief remedy against ankylostomiasis, and is at present practically the only drug used for the eradication of this disease. As shown in the reports of the International Health Commission,[1] the number of patients treated with the oil of chenopodium is very large. It has been employed in several million cases of hookworm in the last few years.[2] Its behavior in the body is therefore a matter of considerable interest, not only to the pharmacologist, but also to those specially interested in the treatment of hookworm and other intestinal parasites. The obvious necessity of making the information concerning its action readily available suggested to me the advisability of presenting this summary of the results of pharmacologic investigations.

PHYSIOLOGIC ACTION

That the action of oil of chenopodium is not confined to the effect on the organisms against which it is directed has been established by experiments on animals. Brüning[3] was the first to call attention to its toxicity by tests on different animals, but the action of the drug has since been made the subject of more extensive investigation in this laboratory. Nelson and myself[4] have shown that oil of chenopodium is a strong local irritant, causing severe inflammation of the mucous membranes. Even very small quantities may prove very toxic and cause death when given to different animals. One-half c.c. of the oil given by mouth to a medium-sized rabbit produced symptoms of severe poisoning, such as vomiting, convulsions, coma, paralysis, and death. The active dose was smaller for cats, 0.2 c.c. per kilogram of oil of chenopodium being toxic, and 0.25 c.c. per kilogram proved fatal. Dogs were much more resistant than cats, but severe symptoms of poisoning were likewise observed in these animals. Of particular importance is the observation we made that a dose which is not effective at first may cause serious symptoms and death when repeated within one or several days. We noticed that sensitiveness to the oil of chenopodium persisted for from five to nine days. This is well worth remembering when the dose has to be repeated, as is sometimes the case, in the treatment of hookworm, for the first dose may not prove efficacious and a second or third dose is required to accomplish the desired result. Attention was also called to the effect of the nutritional condition and of diet on the toxicity of the oil. Fasting or poorly nourished animals succumbed to much smaller doses. The resistance was noticeably greater, on the other hand, in animals that had been receiving a rich carbohydrate diet for several days before the oil was given, or when the administration of the oil of chenopodium was preceded by a sufficient quantity of fatty oil, such as olive oil, coconut oil, or castor oil. Quantities which invariably caused death were survived without the production of symptoms of poisoning when any of these oils were given shortly before or after the administration of oil of chenopodium. Very satisfactory results were also obtained when several doses of about 15 c.c. of the fatty oils were given during two or three days preceding its administration. That disturbance of renal function may be caused was shown in experiments in which the permeability of the kidney was tested after the administration of the oil of chenopodium, for Bengis and myself[5] observed that fat-soluble dyes injected subcutaneously or when fed by mouth failed in some cases to be eliminated in the urine of rabbits under these conditions. Its effect on the kidney was further illustrated in another series of experiments in which evidence was obtained indicating that under certain conditions it may cause renal irritation, even when combined with some substances that were otherwise its physiologic antagonists. Albumin and casts were frequently found when it was given in an emulsion in acacia to rabbits. But when oil of chenopodium was dissolved in one of the fatty oils which, as previously mentioned, decreased the general toxicity of oil of chenopodium, renal irritation became more marked. This, as indicated in a recent report[6] from this laboratory, is probably due to the combined action of the two, that is, the oil of chenopodium and the fatty oil each producing renal irritation, the effect being enhanced when both were given together. It is important to point out in this connection that this does not apply with equal force to carnivorous animals, as the same amounts of oil of chenopodium and coconut oil fed to cats seldom produced these results.

Its poisonous nature was also shown by the tendency to cause depression of the circulation and respiration, as well as to lessen the intestinal movements. In experiments on different animals under anesthesia it was observed that blood pressure may fall considerably in some instances, as 0.02 c.c. of oil of chenopodium per kilogram when injected intravenously may

* From the Pharmacologic Laboratory, Bureau of Chemistry, U. S. Department of Agriculture, Washington, D. C.

1. Report Int. Health Com., Washington, D. C., 1915.
2. Personal communication from Dr. Victor Heiser.
3. Brüning, H.: Ztschr. f. exper. Path. u. Therap., 1906, **3**, 564.
4. Salant, W., and Nelson, E. K.: Am. Jour. Physiol., 1915, **36**, 440.
5. Salant, W., and Bengis, R.: Jour. Biol. Chem., 1916, **27**, 403.
6. Salant, W., and Bengis, R.: Jour. Pharmacol. and Exper. Therap., 1917, **9**, 529.

be followed by a fall of blood pressure amounting to 40 or 50 per cent.[7] Although this was not the rule, it is well to bear in mind that it occurred with sufficient frequency to serve as a warning to the clinician of the nature of the drug he is prescribing. Evidence was obtained that the action might be due to direct effect on the heart. This was also shown in an extensive series of experiments on the isolated frog heart.[8] Very small quantities proved to be quite active, as one minim of the oil of chenopodium to 100 c.c. of Ringer's fluid, when perfused through a normal frog heart, produced marked depression and sometimes arrest of the heart in diastole. In numerous observations on different animals under chloretone or morphin-ether anesthesia it was also noticed that respiration may be depressed or even completely inhibited[9] when the oil of chenopodium is injected intravenously in the form of an emulsion. That the oil of chenopodium is a general depressant is further shown by the effect produced on peristalsis.[10] The movements of the isolated intestines in intact animals may be inhibited by the oil of chenopodium. According to Muirhead and Gerald[11] uterine contraction may likewise be inhibited if the isolated organ is exposed to the oil, provided, however, the concentration is not too low.

Little is known of its fate in the body, but it might be inferred by analogy that, like other essential oils, it is conjugated with glycuronic acids. It is apparently not eliminated uncombined in the urine or in the bile for its odor in these fluids was never detected. On the other hand, its elimination by the lungs[12] was observed in experiments on animals after its intravenous administration, for the characteristic odor in the expired air was unmistakable. It is evident, therefore, from the experimental data cited above, that the drug is very active. That this also holds for human subjects is shown by the incidence of poisoning with this drug. Levy[13] reported twelve cases, nine of which were fatal. Coutant[14] reported recently one case of severe poisoning, but the patient recovered. I have been informed of several cases that have come under the observation of the medical officers of the International Health Commission.[15] The substance under consideration should therefore be handled with caution when used for internal medication as its has a tendency to affect the central nervous system, the heart, respiration, digestive organs, and the kidneys. In the presence of renal or cardiac disorders the oil of chenopodium should be given in small doses only, while in advanced cases of chronic nephritis or heart disease its use would seem to be altogether contraindicated.

As the liver undoubtedly plays an important part in detoxifying the oil of chenopodium while abnormal changes in the gastric and intestinal mucosa may accelerate its absorption into the circulation, it may be expected that in hepatic and gastro-intestinal diseases it may likewise prove more toxic. The importance of the nutritional condition in determining the toxicity of oil of chenopodium has been established by experiments on animals, as has been sufficiently indicated. This applies also to human beings. The case reported by Coutant furnishes evidence of the effects of the drug when administered to the poorly nourished and weak individual. Two doses of 10 minims each given in twenty-four hours were toxic, but the patient was 21 years of age and weighed only 95 pounds.

TREATMENT OF POISONING

Since cases of poisoning are sure to occur, the question of treatment deserves consideration. When large doses have been swallowed lavage may be resorted to with beneficial results. If carried out promptly after the oil is taken it may prove effective in preventing serious consequences, since absorption of the oil from the stomach is slow. In experiments that Livingston and I[16] carried out we often found that several hours may elapse before evidence of absorption into the circulation could be obtained, when the oil was introduced into the stomach of animals, the pylorus having been ligated previously.

The importance of not delaying lavage too long after the poison has been swallowed is further emphasized by the fact that absorption from the duodenum was found, on the contrary, to be very rapid. In some of the experiments in this laboratory the introduction of oil of chenopodium was followed by the immediate appearance of the characteristic effect on the circulation.

No chemical antidote has yet been found. The treatment in cases of poisoning would, therefore, be symptomatic. Stimulation of the respiratory and the circulatory systems would undoubtedly be of value. In experiments on the isolated heart, we found that digitalis and epinephrin are excellent antagonists. The stimulating action of digitalis has been found to be very persistent, and may compeletely overcome the depression caused by the oil. Caffein was also tried out. It, on the contrary, aided the action of the oil of chenopodium. Heart action ceased altogether when perfusion with caffein followed treatment with chenopodium. The action of caffein in poisoning with chenopodium may be different, however, in intact animals, and is being investigated in this laboratory.

While oil of chenopodium may be regarded as a safe remedy for patients in good physical condition, it should be used very cautiously in poorly nourished and weak or neurotic individuals. A diet containing a liberal amount of fats and carbohydrates, fed at least for several days before the treatment is instituted, may render the drug much safer. The routine administration of large doses of castor oil before and soon after oil of chenopodium, as recommended by Hall and Foster,[17] should be given serious consideration, as it may prove to be of prophylactic value.

7. Salant, W., and Livingston, A. E.: Am. Jour. Physiol., 1915, **38**, 67.
8. Salant, W., and Livingston, A. E.: Am. Jour. Physiol., 1916, **41**, 21.
9. Salant, W., and Livingston, A. E.: Am. Jour. Physiol., 1915, **38**, 67.
10. Salant, W., and Mitchell, C. W.: Am. Jour. Physiol., 1915, **39**, 37.
11. Muirhead, A. L., and Gerald, H. F.: Jour. Pharmacol. and Exper. Therap., 1916, **8**, 253.
12. Salant, W., and Livingston, A. E.: Proc. Soc. Exper. Biol. and Med., 1915, **12**, 132.
13. Levy, R. L.: Oil of Chenopodium in the Treatment of Hookworm Infections, THE JOURNAL A. M. A., Nov. 28, 1914, p. 1946.
14. Coutant, A. E.: Chenopodium Poisoning, THE JOURNAL A. M. A., Nov. 25, 1916, p. 1599.
15. Personal communication from Dr. Victor Heiser.
16. Salant, W., and Livingston, A. E.: Proc. Soc. Exper. Biol. and Med., 1915, **12**, 132.
17. Hall, M. C., and Foster, W. D.: Oil of Chenopodium and Chloroform as Anthelmintics, THE JOURNAL A. M. A., June 30, 1917, p. 1961.

Acute Intestinal Troubles in Germany.—The *Nederlandsch Tijdschrift* quotes from J. Schwalbe in the *Deutsche medizinische Wochenschrift*, No. 33, that diarrhea is prevalent, especially in northern Germany. He has been making a collective inquiry on the subject, and states that on account of the lack of bacteriologic examination it is impossible to say to what extent contagion is involved, but that in any event the bread and the poor quality of the food have certainly not a little to do with it.

THE SYNDROME OF MILD REVERSE PERISTALSIS *

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Digestion seems to suffer very little from disturbances of secretion. Many physicians have commented on the fact that we often discover achylia gastrica accidentally in patients who have no complaint to make about their digestion. The great obstacle to making an early diagnosis of cancer of the stomach is the fact that although the mucous membrane may be almost or entirely gone, these patients ordinarily have no symptoms until the growth is large enough to block the pylorus. They will then have trouble until a channel sloughs through the tumor, after which they may be perfectly comfortable again. Similarly, there may be no complaint of indigestion after extensive resection of the bowel. Men have lived in comfort, except for an occasional diarrhea, after removal of one half of the small intestine. As Taylor[1] has aptly said, we seem to have "duplicate plants" for chemical digestion. If pepsin fails, the pancreatic ferment can come to the rescue, and when that is shut off, the gastric and intestinal ferments can, between them, do remarkably well. On the chemical side, the factors of safety are large; on the mechanical side, there is only the one muscular tube which cannot be replaced.

The conclusion, then, and it is one of the most important that the gastro-enterologist should keep in mind, is that gastro-intestinal symptoms are motor symptoms—they arise when the normal progress of the food is disturbed. We can conceive, now, of four types of motor disturbance: (*a*) speeding up of the current; (*b*) slowing; (*c*) complete stoppage, and (*d*) reversal. It is strange how little thought has been given in medical literature to the last-named possibility. We know that when a loop of bowel is distended or stimulated at any point, it can send off impulses in both directions, just as a stone thrown into a canal sends waves upward as well as downward.[2] That retrograde progress from anus to pharynx can rapidly take place has been well known since the time of Galen. All physicians have observed fecal vomiting in ileus; and many have seen the vomiting of suppositories and enemas by nervous women.[3] I have talked with a number of intelligent persons who objected to their nutrient enemas because of the bitter taste of the peptones given. Dr. Emge of this city tells me that after severe pelvic operations it has been his custom to give coffee enemas, which soon tinge the vomitus. The first time it happened he thought it was due to hemorrhage, but chemical analysis showed that it was coffee and not blood. This article could be filled with such observations culled from medical literature.[4]

It is now well known that barium enemas almost always flow back into the ileum and sometimes even into the duodenum.[5] I have seen liquid and gas pass rapidly from the colon to the duodenum in cats. The animals were anesthetized and their abdomens opened under salt solution. In order to produce this backflow, the rectum was tied off, and the colon filled with a thick soup. After this part of the bowel had become very irritable and highly tonic through its efforts at emptying, some of the material would be rushed well up into the small intestine. We know that reverse peristalsis is normal in the right half of the colon; and the return of feces from the rectum to the upper colon has been observed.[6] Boldireff and others have shown that the regurgitation of duodenal contents into the stomach is a physiologic and common occurrence.[7]

Granting, then, that reverse transport[8] of material is a common happening in the tract, and that its severe manifestations, such as fecal vomiting, are generally known, we must face the probability that milder forms are passing unrecognized. A few years ago we were diagnosing hyperthyroidism only in the cretin and in the equally deformed myxedematous; today we look for the "formes frustes" in which there is perhaps some drowsiness, a dry, hairless skin or a deficient menstrual flow. In the following paragraphs I wish to discuss briefly a few symptoms which are often found together, or alternating one with the other in the same patient, and which I believe indicate mild reverse peristalsis. The most important ones and those about which I feel surest are vomiting, regurgitation, heartburn, belching, nausea, "biliousness" and coated tongue.[9] Less important and more doubtful are globus, foul breath, and the feeling of fulness immediately after the beginning of a meal.

This article is, in many ways, a sequel to one previously published.[10] Those who have read that article will undoubtedly find it easier to understand the arguments advanced at this time. The principal point to be remembered is that the digestive tract is a muscular tube in which material moves from regions of high tone, high rhythmicity and high irritability to regions of lower tone, lower rhythmicity and lower irritability. The presence of food or of an irritating lesion in any part of the tract tends to raise the tone and irritability of that point, and in this way the normal gradient may be upset. The following experiments of Hess and Kelling may help to explain what is meant by the gradient of forces in the tract. Hess[11] put a small balloon into the bowel of a dog. A string fastened to the balloon ran out of a gastric fistula and over a pulley. At the end of the string was a little bag which could be filled with shot until its weight stopped the progress of the balloon. Eighteen cm. from the pylorus, 228 gm. were needed to balance the pull exerted by the muscle; 20 cm. farther down the pull was only 90 gm., and 12 cm. below, or 50 cm. from

* From the George Williams Hooper Foundation for Medical Research, University of California Medical School.

1. Taylor: Digestion and Metabolism, Philadelphia, Lea and Febiger, 1912, pp. 152, 153.

2. Cannon, W. B.: Am. Jour. Physiol., 1909, **23,** xxvii; The Importance of Tonus for the Movements of the Alimentary Canal, Arch. Int. Med., October, 1911, p. 117.

3. In a case reported by Treves, enemas of castor oil and methylene blue solution were vomited within ten minutes of their administration. He operated, expecting to find a gastrocolic fistula, but found no such cause for the phenomenon (Lancet, London, 1898, **1,** 643). A review of the literature reveals that a surprising number of these patients have been operated on for supposed gastrocolic fistulas.

4. Weber, F. Parkes: Brain, 1904, **27,** 170. Langmann: Jacobi Festschrift, New York, 1900, p. 375. Schloffer: Beitr. z. klin. Chir., 1898, **24,** 392.

5. Quimby: Am. Jour. Roentgenol., 1914, **1,** 403.

6. Schwarz: München. med. Wchnschr., 1912, **59,** 2155. Drummond: Brit. Med. Jour., 1914, **1,** 240.

7. Boldireff states that in animals which have fasted for some time, intestinal juice will run out of a gastric fistula continuously in large amounts, from 100 to 300 c.c. in fifteen hours (Zentralbl. f. Physiol., 1904, **18,** 457).

8. The term "retrograde transport" will be used in a number of places in which the present state of our knowledge does not permit me to say that actual reverse peristalsis occurs. More work will have to be done before we know in all cases just what type of contraction causes material to move orad.

9. Leube has discussed just these symptoms under the title "Nervous Dyspepsia" in an excellent article in the Verhandlungen des Kongresses für innere Medizin, 1884, **3,** 204.

10. Alvarez, W. C.: The Motor Functions of the Intestine from a New Point of View, THE JOURNAL A. M. A., July 31, 1915, p. 388.

11. Hess: Deutsch. Arch. f. klin. Med., 1886-1887, **11,** 105.

the pylorus, the pull was 75 gm. In a man with a jejunal fistula, I found a similar marked decrease in the pull exerted by the muscle as the balloon went down the intestine. The sluggishness of the ileum was in marked contrast to the great irritability of the jejunum. Kelling[12] has shown a reversal of these forces in dogs in which the ileum was tied just above the ileocecal sphincter. Next day, a manometer tied into the active ileum, 20 cm. above the obstruction, showed pressures varying between 10 and 20 cm. of water; while in the jejunum, the pressure was from 0 to 5 cm. It can easily be seen that under such conditions, fluids would flow backward toward the stomach.

At times, the gradient may perhaps become leveled. In a number of cases of duodenal ulcer, I have watched contraction rings appearing in various parts of the stomach and dying out again, apparently unable to advance as waves in the direction of the ulcer. A still commoner finding with duodenal ulcer and chronic appendicitis is the stomach that fails to empty itself after six hours, in spite of active peristalsis and a patulous pylorus. Roentgenologists used to speak of pylorospasm in these cases, but more and more they are realizing that the pylorus is not always at fault. Those who have learned to milk a cow will understand more easily what I mean, when they remember that it is not powerful and rapid squeezing that brings the milk, but a coordinated contraction beginning at the base of the teat and spreading downward. Many think when the barium meal does not advance that there must be either a contracted area ahead or else that the muscle is atonic. The following experiment shows that neither of these conditions need be present:

A rabbit was anesthetized (with urethan) and its abdomen opened under salt solution. The lower ileum was pinched with a hemostat so that the tissues were slightly bruised. After five or six hours, the bowel above the pinch was found distended with fluid, and contracting powerfully here and there. In spite of this activity and the fact that the lumen of the bowel was in no way occluded, nothing had been able to approach within 15 cm. of the injured, hypertonic region.

In my previous paper, I discussed upsets in gradient due to irritating lesions and to the introduction of food or other substances into the lower part of the tract. Since then, some work on smooth muscle has suggested another and possibly a very important way in which the gradients may be upset. I was able to show that the aboral progress of waves over the stomach is due, at least in part, to the fact that the latent period of the muscles around the cardia is less than that of the muscle in the pyloric antrum.[13] The muscle at the cardia is very sensitive to trauma or to adverse conditions, while that in the antrum is so hardy that it will often react better after it has been for forty-eight hours in the ice-box. This peculiar difference in the muscle from the two ends of the stomach is probably responsible for the fact that the gradient of latent period is actually reversed in distempered or sickly dogs. In these animals, the disease toxins apparently injure the sensitive cardiac muscle to such an extent that it reacts very sluggishly to strong currents. The antral muscle, on the other hand, generally contracts even more promptly than in normal animals. It seems very probable that this reversal of the gradient has something to do with the unwillingness of these dogs to take food.[14] Recent work, yet unpublished, shows that a similar reversal takes place in the gradient of latent period in the intestine in these diseased animals.

Very similar observations have been made on the heart. In the ascidian, the heart is a straight tube, one end of which acts for a while as pace-maker because it is the region of highest rhythmicity. It suffers most from fatigue, however, so that before long the other end of the heart is left with the higher rhythmicity; this now takes the lead, and the blood current is temporarily reversed. A similar upset takes place from time to time in the selachian heart.[15] Although the gradient is more stable in the hearts of higher forms of life, it has recently been discovered with the string galvanometer that a number of supposedly normal dogs have atrioventricular rhythm, that is, the gradient of rhythmicity in their auricles is reversed[16] In some human cases, a reversal has been observed which has righted itself as the patient improved in general health.[17] It seems to me very likely that the steepness of the gradient of forces in the gastro-intestinal tract varies a great deal, not only in different people, but at different times in the same person. The dyspeptic who goes on a vacation probably develops a steeper gradient; rough food will then be carried along without "hanging up" anywhere; his indigestion will go and his bowels will move normally.

Perhaps we can explain in this way the nausea and vomiting of nervous, worn-out women. Some of the most striking manifestations of reverse peristalsis are observed in the hysterical. Roentgenographic examinations and exploratory operations often reveal nothing to account for the trouble, and it can be cured only by rest and overfeeding.

VOMITING

The progress of gastro-enterology has been greatly hampered by the idea that the stomach is the organ of digestion. Even physiologists have been so blinded by this idea that very few of them have paid any attention to the behavior of the intestine during vomiting. My own experience soon convinced me that vomiting may begin with increased tone and activity in the jejunum.[18] I was able to confirm Ewald's statement that in ileus the stomach is filled with intestinal contents long before fecal vomiting appears.[19] Vomiting has been produced in dogs by reversing stretches of jejunum, so that the current would set backward toward the stomach. These dogs could be kept alive and comfortable if fed soft foods slowly. Large meals or rough food would be rejected.[20] It has been

12. Kelling: Ztschr. f. Biol., 1903, **44**, 249.
13. Alvarez, W. C.: Am. Jour. Physiol., 1916, **41**, 321.
14. Alvarez, W. C.: Am. Jour. Physiol., 1917, **42**, 430, 446.
15. Bottazzi: Ztschr. f. Physiol., 1902, **43**, 404.
16. Eyster and Meek: Heart, 1913-1914, **5**, 119.
17. Williams and James: Heart, 1913-1914, **5**, 112. Hart: Ibid., 1913-1913, **4**, 128.
18. Openchowski (Zentralbl. f. Physiol., 1889, **3**, 4), in describing vomiting says, "In the beginning, great activity of the intestine" (anfangs starke Unruhe der Gedärme). Poensgen says waves have been observed to travel from the duodenum on to the stomach in vomiting (Motor Verricht. d. menschl. Magens, 1882, p. 8). Similar statements have been made by Wepfer, quoted by Brinton (Cyclopedia of Anatomy and Physiology, London, 1859, **5**, 317) and by Müller (Handbuch der Physiologie, 1835, **1**, 485). Boldireff noted, during some experiments, that periods of intestinal activity were often accompanied by vomiting (Zentralbl. f. Physiol., 1904, **18**, 489). I once attended a child with severe recurrent vomiting in whom the attacks were preceded by violent intestinal peristalsis and borborygmus loud enough to be heard across the room. I have also seen vomiting of the food given through a jejunal fistula. Such feeding must be done very slowly with the food exactly at body temperature. Vomiting has been observed also in feeding by duodenal tube (Stockton: Diseases of the Stomach, New York, D. Appleton & Co., 1914, p. 81).
19. Ewald: Berl. klin. Wchnschr., 1907, **44**, 1416.
20. Mühsam: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1900, **6**, 460. Enderlen and Hess: Deutsch. Ztschr. f. Chir., 1901, **59**, 240.

shown repeatedly that the vomiting is not due to the irritation of bile and pancreatic juice in the stomach,[21] so I believe it must often be due to, and part of, the reverse peristalsis beginning in the bowel. It should be noted that vomiting is often severe with low intestinal lesions and that it may be entirely lacking in serious gastric disease, such as ulcer and carcinoma (without pronounced pyloric obstruction).[22]

Vomiting is often severe in pregnancy and with some lesions of the pelvic organs. I refer here not to the so-called "toxemic" but to the "reflex" or "nervous" type of vomiting. I believe the uterus in some way influences and raises the tone, irritability and activity of the lower part of the bowel, so that there is a tendency to reverse peristalsis. The greater activity of the colon may be due to its sharing in the hyperemia of the pelvic organs.[23] It is conceivable also that there may be a spread of tone along the pelvic nerves. Elliott and Barclay Smith found that they could raise the tone of the midregion of the colon, and produce anastaltic waves by stimulating these nerves in animals.[24] This tendency to reverse peristalsis in pregnancy was well recognized by Campbell[25] who suggested that we utilize it in giving nutrient enemas in the vomiting of pregnancy. He felt sure that these enemas would be carried well up into the small intestine where they could be digested and absorbed. It is interesting that the ancients also recognized this tendency to anastalsis. The Brugsch papyrus advises, as a test for pregnancy, the giving of pounded watermelon in milk; if the woman has flatulence only and no vomiting, she is not pregnant.[26] Hippocrates used "hydromel" in much the same way.[27] It is not a bad idea that an irritant not sufficient to upset a normal tract might be able to reverse one that already was tending that way.

It seems to me that those who ascribe the vomiting of pregnancy to toxins derived from the fetus do not pay enough attention to the fact that exactly similar phenomena are seen in many women on the first day of menstruation, at the menopause and with some pelvic diseases, such as dragging displacements, fibroids and pus-tubes. There is a large literature on this subject, and the symptoms enumerated are those discussed in this article. They often disappear immediately after hysterectomy, ventrofixation, etc. I have seen similar disturbances in a few men with large prostates and distended bladders.[28] It does not do any good to call these troubles "reflex" when the path cannot be pointed out. Gaskell's research has absolutely demolished Robinson's idea that the solar plexus is an "abdominal brain" with reflex centers.[29] The stormy vomiting and dynamic ileus often seen after pelvic operations may be due to a great and sudden increase in the irritability of the colon. One may also explain in this way the severe gastro-intestinal upset seen sometimes after injury to the testis.[30]

REGURGITATION

Vomiting shades off into regurgitation in many cases.[31] People will taste certain foods all day; particularly fats, which tend to return from the bowel into the stomach.[32] Often in duodenal ulcer, gallbladder disease and chronic appendicitis there will be regurgitation of bile-stained fluid before breakfast. Some women regurgitate only at the beginning of the menstrual period. Troublesome regurgitation may cease a few minutes after the patient has a bowel movement. The distention of the pelvic colon may have been keeping that region overactive and causing it to give off reverse waves.[33] These waves need not be so powerful that they sweep material along before them. Some time ago, while recording the activities of seven different regions of the rabbit's intestine on the same drum, I found that short peristaltic rushes here and there were originating in ripples that were coming, unnoticed by the naked eye, all the way from the pylorus.[34] In the same way, I believe it probable that ripples coming from a full and overactive colon, or from the irritable ileocecal region in appendicitis, will run up the bowel and show themselves in the stomach and esophagus as waves of acid regurgitation. The objection may be raised that the connective tissue block at the pylorus which prevents the spread of gastric waves on to the duodenum will likewise prevent the upward spread of reversed waves. I think, however, that since my records from the cat's intestine show that ripples beginning in the duodenum generally coincided with, and probably were part of, waves arriving at the pylorus, it is quite possible that ripples going in the opposite direction can also pass the barrier.

The following case is very suggestive: A constipated infant regurgitated so much that her pillow was always soaked. After weeks of this her bowels suddenly became a little loose, and the day this occurred, the mother was surprised to find the pillow perfectly dry. It remained that way for over a week, until the bowels became constipated again. Apparently the establishment of a good current downward instantly

21. The duodenum has been closed off in man so that all secretions had to go through the stomach on their way to the jejunum, and yet there was no trouble (Moynihan: Brit. Med. Jour., 1901, **1**, 1136). Chlumski performed similar operations on dogs without causing them to vomit (Beitr. z. klin. Chir., 1898, **20**, 519-523). Cholecystogastrostomy in man and dogs does not produce vomiting (Oddi: Conter. Clin. ital., Milan, 1897, **1**, 77). See also Kolbing: Beitr. f. klin. Chir., 1902, **33**, 518. Ledderhose: Arch. f. klin. Chir., 1899, **59**, 153. Wiedemann: Beitr. z. klin. Chir., 1914, **89**, 594. Rosenberg: Arch. f. d. ges. Physiol., 1898, **73**, 419.

22. Faulhaber and von Redwitz: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1914, **28**, 137. Cohnheim and Dreyfus produced vomiting in dogs by distending a balloon in the intestine. They found that a slowing of gastric motility could easily be effected by irritating the bowel, whereas it was not observed after the production of a severe gastritis. They point out that we must look more to the intestine for the cause of gastric disturbances (Ztschr. f. physiol. Chem., 1908, **58**, 56, 82).

23. Carnot and Glenard noticed while perfusing the excised intestine that its activity was greatly increased when the blood flow was more rapid (Compt. rend. Soc. de biol., 1912, **72**, 496, 661). An increased activity of the colon might account for the looseness of the bowels in many women during menstruation.

24. Elliott and Barclay Smith: Jour. Physiol., 1904, **31**, 282.

25. Campbell (Tr. Am. Gynec. Soc., 1878, p. 268) says that the woman with pregnancy or pelvic disease has an irritable tract in which "response is usually by inverted rather than by direct action: eructation, regurgitation, nausea, vomiting, constipation, far more frequently than diarrhea and other manifestations of downward action. The tract gets into the habit of retrostalsis."

26. Neuberger: History of Medicine, London, 1910, **1**, 29.

27. Hippocrates: Adams' Translation, New York, **2**, 242.

28. Herschell describes three cases of vomiting in men with retention of urine; two were cured by beginning the catheter life, the other by operation (Med. Press and Circ., 1905, **130**, 559). See also Hutchinson, Brit. Med. Jour., 1910, **1**, 485. Stockton: Diseases of the Stomach, New York, D. Appleton & Co., 1914, p. 129. Peyer: Samml. klin. Vortr., 1890, p. 3182. Austin: Diseases of the Digestive Tract, St. Louis, 1916, p. 52.

29. Gaskell: The Involutary Nervous System, London, 1916.

30. An inflamed hydrocele, contusion of the testicle, or operation for hemorrhoids may bring about the picture of acute ileus (Müller: Deutsch. Arch. f. klin. Med., 1912, **105**, 37).

31. Austin: Diseases of the Digestive Tract, St. Louis, 1916, p. 337. Cohnheim: Digestive Disorders, Translated by Fulton, Ed. 3, Philadelphia, J. B. Lippincott Company, 1914, p. 244. Valentin: Lehrbuch der Physiologie, 1847, **1**, 273. Paterson, in describing a case of chronic appendicitis, said: "Thirteen or fourteen years ago the patient began to suffer from 'risings in the stomach,' and seven years ago he began to suffer from attacks of vomiting" (Proc. Roy. Soc. Med., 1910, **3**, Surg. Sect., p. 193).

32. Alvarez, W. C.: The Motor Functions of the Intestine from a New Point of View, THE JOURNAL A. M. A., July 31, 1915, p. 388, Notes 43 and 44.

33. Smith and Lewald say, "The frequency with which colic accompanies regurgitation is suggestive of their commoin origin." The waves causing regurgitation may arise in the overactive part of the intestine where there is colic (Am. Jour. Dis. Child, April, 1915, p. 271).

34. Alvarez, W. C.: Am. Jour. Physiol., 1915, **37**, 273.

stopped all regurgitation upward. The ancients not only gave purges to stop vomiting, but they stopped excessive purgation by giving emetics.[35]

HEARTBURN

Before giving my views as to what heartburn is, I must emphasize what it is not. A good many years ago I was surprised to find that only a small proportion of the patients complaining of sour stomach and heartburn have an actual increase in their total acidity and free hydrochloric acid. Titration of the burning fluid that was being regurgitated often showed subacidity, and gastric analyses made during periods of discomfort did not show values any higher than those made during periods of relief. A review of the literature showed that similar observations have been made by every writer who has done any work on the subject.[36] As far back as 1884, Reichmann[37] stated clearly that although it might be customary for laymen and physicians to ascribe heartburn to an increase in gastric acidity, such an increase could only occasionally be demonstrated.

This fact is not so surprising when we remember that almost all of those who have put from 0.5 to 2 per cent. hydrochloric acid into the human stomach by tube agree that the mucous membrane cannot sense it as pain or heartburn.[38] At most, there is a slight feeling of warmth. A number of writers assert that the diseased stomach is so hyperesthetic that it can feel the acid. Talma and his pupils found in a few cases with possible ulcer that the acid would cause pain, rarely burning.[39] This idea of a hyperesthetic mucous membrane has been discredited, however, by the work of Hurst,[40] Löwenthal[41] and Schür,[42] who showed that persons with ulcer, demonstrated later at operation; could not feel the acid any more than normal persons can. It might also be remarked that heartburn is not a common complaint with gastric ulcer. Recently the work of Ginsburg, Tumpowsky and Hamburger[43] indicates that pain felt by ulcer patients on the introduction of acid is due not to a direct irritation of the nerve-endings, but to powerful contractions set up by the acid. Some writers adopted the idea of "hyperaciditas larvata"—a hyperacidity which is present long enough to produce symptoms, but which disappears about the time the stomach tube is passed. Schmidt thought the persons with pain and heartburn must have lost a protecting layer of mucus over the gastric lining.

It seems to me that the true explanation is the one given by Reichmann[37] thirty-three years ago. He had people swallow a little gelatin-coated sponge on the end of a string. This was left for ten minutes in the esophagus just above the junction of the middle and lower thirds. It was found that the fluid expressed from the sponge was acid in the persons who had heartburn and alkaline in normal controls. He concluded, therefore, that heartburn is due to the regurgitation of more or less acid gastric juice through a relaxed cardia into the esophagus. This view has been held independently by a number of observers. Some doubt has been cast on it by the work of Hurst,[40] who states that the esophagus is not sensitive to acid. This seems strange in view of the fact that those who have experimented with acid have had to give it by stomach tube so as to avoid burning sensations in the pharynx and esophagus. The lower pharynx seems to be much more sensitive than the esophagus, and most persons feel the heartburn in the back of the throat.[44] Further work is needed before we know just where and how the acid causes burning. Some of my patients who take dilute hydrochloric acid complain of burning, others do not. I have experienced severe and typical heartburn after drinking "acidol"[45] in water. Some nervous women complain at times of a burning feeling in the epigastrium, as if the stomach were "on fire." This is probably an entirely different thing—a paresthesia which at times moves down over the right hip, showing that it has nothing to do with the stomach.

To my mind the most suggestive thing about true heartburn is its well known association with belching and regurgitation. Patients often say they feel the burning when the fluid comes up. Occasionally it is worse when the sufferer is lying down, perhaps because the gastric juice can then more easily run back up the esophagus. It is often brought on by eating fats which, as I have already pointed out, favor regurgitation. This may be due to the fact that they depress gastric activity while at the same time they stimulate the bowel. Many men suffer from heartburn after using tobacco. In habitués, some regurgitation of gastric juice probably represents the nausea and vomiting of the neophyte.

Many persons with heartburn are relieved by taking alkalis. These drugs may do good in two ways: first, by neutralizing the acid in the stomach, and secondly, by enabling the patient to belch so noisily and satisfactorily that he does not feel the need of doing it again for the rest of the day or night. When there is no regurgitation and belching, there is rarely any heartburn. The fact that many people with subacidity are relieved by soda shows that its virtues are not due entirely to its antiacid effect. I have seen a few persons who were made worse by alkalis and were immediately relieved by the administration of hydrochloric acid. I was led to try this by Cannon's[46] observation that an increase in gastric acidity closes the cardia

35. Paulus Aegineta: London, 1847, **3**, 489, 499. Hippocrates also recognized the possibilities of reversing the current. He says, "In confirmed diarrhea, vomiting, when it comes on spontaneously, removes the diarrhea" (Adams' Translation, New York, **2**, 252).

36. Schütz made a careful study of 830 cases, and concluded that only a small percentage of people with hyperacidity have symptoms (Wien. med. Wchnschr., 1906, **56**, 2241-2410). See also Steele, J. D.: The Relation of Excessive Gastric Acidity to Gastric Symptoms, THE JOURNAL A. M. A., Aug. 18, 1906, p. 496. Stockton: Diseases of the Stomach, New York, D. Appleton & Co., 1914, p. 157. Palfrey: Am. Jour. Med. Sc., 1913, **145**, 796. Lockwood: Diseases of the Stomach, Philadelphia, Lea & Febiger, 1913, pp. 461, 465. Von Noorden: Ztschr. f. klin. Med., 1904, **52**, 2. Gross, M. H., and Held, W.: Ulcus Ventriculi, Arch. Int. Med., March, 1914, p. 445. Verhaegen: La cellule, 1897, **12**, 70. Illoway: Arch. f. Verdauungskr., 1902, **8**, 135. Blankenhorn, M. A.; Harmon, G. E., and Hanzlik, P. J.: Some Clinical Physiologic and Chemical Observations on Ptomain Poisoning from "Creamed" Codfish, Arch. Int. Med., January, 1916, p. 140. Kaufmann: Ztschr. f. klin. Med., 1905, **57**, 491; Arch. f. Verdauungskr., 1907, **13**, 622. Leube: Verhandl. d. Cong. f. inn. Med., 1884, **3**, 215.

37. Reichmann: Berl. klin. Wchnschr., 1884, **21**, 769.

38. Hertz: Proc. Roy. Soc. Med., 1910, **3**, Surg. Sect., p. 101. Carlson and Braaflladt: Am. Jour. Physiol., 1914, **36**, 163. Ginsburg, Harry; Tumpowsky, Isidor, and Hamburger, W. W.: Contributions to the Physiology of the Stomach, XXX, The Newer Interpretation of the Gastric Pain in Chronic Ulcer, THE JOURNAL A. M. A., Sept. 30, 1916, p. 990. Zimmermann: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1909, **20**, 445. Lowental: Berl. klin. Wchnschr., 1892, **29**, 1188. Schür: Med. Klin., 1911, **7**, 919. Schmidt: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1908-1909, **19**, 278. Bönniger: Deutsch. med. Wchnschr., 1908, **45**, 396.

39. Talma: Ztschr. f. klin. Med., 1884, **8**, 407.

40. Hurst: The Sensibility of the Alimentary Canal, London, 1911, p. 12. (In a recent letter the doctor tells me he has changed his name from Hertz to Hurst.)

41. Löwenthal (Note 38, fifth reference).

42. Schür (Note 38, sixth reference).

43. Ginsburg, Tumpowsky and Hamburger (Note 38, third reference).

44. On numberless occasions I have seen barium-containing milk thrown quickly and forcibly back into the upper part of the esophagus. This seemed to be due to powerful contractions of the muscle near the cardia. It must be remembered that sensations derived from the esophagus between the clavicles and nipples may be referred either upward into the throat or downward to the epigastrium (Boring: Am. Jour. Psychol., 1915, **26**, 34).

45. Hydrochloride of betain, which liberates hydrochloric acid in solution.

46. Cannon: Am. Jour. Physiol., 1908, **23**, 105.

more tightly, and prevents regurgitation into the esophagus. It is possible that some persons have congenitally relaxed or patent cardias. Kelling[47] has observed this with the esophagoscope. This seems the more likely when we remember that the cardia is not a well formed sphincter like the pylorus. In many of the lower vertebrates it is practically absent.

If heartburn is due to regurgitation of gastric contents into the esophagus, why is it that the food that comes back into the mouth sometimes tastes so fresh and good that it can be chewed and swallowed again, while at other times, in the same person, it is fluid, bitter and intensely acid? It is now well known that there are three physiologically distinct parts of the stomach: the fundus, which holds the food practically motionless, often in layers as it comes in; the muscular antrum, which breaks the food down into a purée and mixes it with the gastric juice, and the canalis gastricus, which carries fluids along the lesser curvature and out into the duodenum. I believe the regurgitated food that tastes fresh has come from the top of the pile in the fundus. The burning fluid comes from the antrum or even from the duodenum,[48] and has probably traveled up the gastric canal.

Heartburn is often very severe and trying in pregnancy, when it may take the place of vomiting. It may be a prominent symptom on the first day of menstruation, with pelvic disease, and at the menopause.[49] Care must be taken, however, to rule out cholecystitis in these cases. Heartburn may be marked in chronic appendicitis, duodenal ulcer and gallbladder disease—in all of which I think it represents reverse peristalsis from the lesion.

BELCHING

We must first distinguish three types: first, a gurgling sensation which some people feel running up the esophagus; second, involuntary regurgitation of gas from the stomach, and third, a voluntary swallowing of air which goes about half-way down the esophagus only to be brought up noisily again. The people with the third type sometimes get some air into the stomach and feel much better when they get it up again. It seems to me as if they were scratching themselves with the air. Often, as with scratching, the more the victim does, the more he wants to do, so that the only way in which to get some relief is to desist until the desire has passed off.

Although the first two forms are more important clinically, I believe the third one also indicates a tendency to reverse peristalsis. These patients should not be sneered at and simply called aerophagics—they are uncomfortable, and feel that they would be relieved if they could only get up one final enormous belch. Sometimes they secure this by taking a little sodium bicarbonate, and the relief obtained is very real. A man who has been pacing the floor at 2 a. m., suffering with acid regurgitations, will suddenly belch successfully, or vomit a little fluid, and five minutes later he will be dropping off to sleep. The relief obtained is so out of proportion to the amount of air or liquid voided that the main result must be the quieting down of the tract after the reverse waves have succeeded in running out. I can only compare it to the tremendous psychic and physical relief that comes to a sensitive person who reaches a toilet after he has been restraining a rectum full of gas for hours at some public gathering. The violent peristaltic contractions cease instantly, and the whole body quiets down.

I think all roentgenologists will agree that people do not belch because they have an unusual amount of gas in their stomachs. In seven years' experience, I have seen but one such case. It is also fairly well recognized by thinking physicians that fermentation of the gastric contents can play no part in the causation of belching. The stomach empties so rapidly that the bacteria have no time in which to multiply sufficiently. Sometimes the roentgen ray reveals a large amount of gas in the splenic flexure, pushing up the left leaf of the diaphragm. Naturally, in such cases, no amount of belching can ever bring relief.

Although it is true that many chronic belchers are highly sensitive, nervous persons who are constantly feeling queer things in various parts of their bodies, I would emphasize the fact that careful study of their digestive tracts will often show ulcer, periduodenal adhesions, gallbladder disease or appendicitis. These lesions must be held responsible for the epigastric discomfort and the tendency to reverse peristalsis.

NAUSEA

Nausea is ordinarily the precursor of vomiting. It is strange how little has been written about such a common symptom. The best article I have found is by Boas.[50] He notes that it is associated with intestinal lesions in which there is abnormal peristalsis, and that in many cases, the stomach probably has nothing to do with it. My own impression has been that nausea is brought out most pronouncedly by reverse tendencies beginning low down in the bowel. Thus, it is often marked in acute inflammation in the lower colon, in acute and chronic appendicitis, and in low intestinal obstruction. As is well known, it is severe in pregnancy and in other disturbances of the pelvic organs. It may be very annoying at the menopause, and Boas has seen it persist for a long time after hysterectomies. The pronounced nausea of some hysterical women may be due to associated pelvic disease. Nausea has been observed also in men with enlarged prostates and distended bladders. I have seen it as the first and, for months, the only symptom of carcinoma of the pelvic colon.

On the other hand, I have never seen or read of it with esophageal disease or with the regurgitation due to cardiospasm. It is usually absent, or only a minor complaint, in diseases of the stomach and duodenum. It has been produced in dogs by the injection of irritant salt solutions through fistulas into the duodenum or jejunum. The dogs appeared to be nauseated when the fluid regurgitated into the stomach.[51] Patients suffering with nausea have sometimes described it so vividly as coming in ascending waves that I have wondered whether they might not be feeling actual reverse waves in the bowel.

The nausea and vomiting caused by disgusting mental impressions, by rolling movements, as at sea, and by cerebral disease might conceivably be due to a reversal of the gradient in the gastro-intestinal tract brought about by an unequal or dissimilar action of the vagus on different parts of the stomach and

47. Kelling: Ztschr. f. Biol., 1903, **44**, 254.
48. Schilling found in six cases that the regurgitated fluid was alkaline. In one man who had hypersecretion and hyperacidity, the fluid which gushed from his mouth seemed to be pure duodenal juice (Zentralbl. f. inn. Med., 1915, **36**, 501).
49. A review of the literature reveals that, if anything, the gastric acidity is lowered in these disorders.
50. Boas: Berl. klin. Wchnschr., 1909, **46**, 1101.
51. Cohnheim and Dreyfus: München. med. Wchnschr., 1908, **55**, 2484.

bowel.[52] A review of the literature on the vagus shows that this is not improbable. May[53] found the inhibitory effects more pronounced on the cardiac than on the pyloric end of the stomach. Stimulation of the vagus has produced regurgitation of intestinal contents into the stomach and even vomiting.[54] Very similarly, in the heart of the frog or turtle, vagal stimulation tends to reverse the impulse because it depresses the sinus and leaves the auriculoventricular region active. This is more likely to occur in hearts which have been experimented with awhile and in which the sinus region has become disproportionately fatigued.[55]

Some people experience nausea when constipated, and are relieved immediately after emptying the rectum. Nausea may be associated with diarrhea also, if the bowel is trying to clear itself both ways from some irritated region. It is very common to see nausea produced by cleansing enemas. In one of my patients this occurs only if the enema is made irritating by the addition of much salt or soap. Incidentally, Nothnagel and others[56] have shown that the addition of salt to liquids injected into the bowel will cause them to travel much farther up the tract. It is interesting that the ancients gave hellebore by mouth to purge and by rectum to produce vomiting.

COATED TONGUE AND FOUL BREATH

It is commonly supposed that the tongue, in some sympathetic way, reflects the condition of the gastric mucous membrane. I can find no proof of any kind for these views. They seem to be based on the idea, unfortunately still too prevalent, that most gastrointestinal upsets are due to a gastritis. Recent, more exact necropsy studies, and the examination of tissues secured at operations have failed to reveal the expected changes.[57] Inflammatory changes were strikingly absent even in the stomachs of a series of alcoholics dying in delirium tremens.[58]

It seems to me that by far the best explanation of the coated tongue has been given by Kast.[59] He gave lycopodium powder in sealed capsules to a number of persons, and was able to recover the typical spores in the mouths of most of them the next morning. I have repeated these experiments, and have found no difficulty in confirming them. In one case, of a woman who regurgitates a good deal, particularly during the menstrual period, the tongue's coat became yellow from the lycopodium.

It is possible that the particles on the tongue may come from even below the stomach. Grützner and others[60] have shown in animals and in man that lycopodium spores or other finely divided and easily recognizable material, given in enemas, will travel in a few hours from the rectum to the stomach. Closely corresponding to these experiments are those of Uffenheimer, Dieterlen and others,[61] who found that tubercle and prodigiosus bacilli injected by rectum could be recovered from the pharynx a few hours afterward, when every precaution had been taken to prevent the animals from licking themselves anywhere or touching their feces. Transmission through the blood stream was also fairly well ruled out.

Laymen and physicians often hold the view that the bad breath associated with "biliousness," a coated tongue, a "dark brown taste" and constipation is due to the exhalation of absorbed toxins. The experiments previously quoted show that the foul breath may just as easily be due to the presence of actual colonic material on the back of the tongue. If these reverse currents are so strong in apparently normal persons, it would not be surprising if they were stronger in the diseased. It goes without saying that these reverse currents must not be blamed for the coated tongue or foul breath in any particular case, until other possible causes in nose, mouth and pharynx have been ruled out.

GLOBUS

Some of us have been unfortunate enough to swallow while a wave or regurgitation was coming up, and we have felt a painful, tearing feeling as the two waves met. It seems to me that this may be the mechanism of globus.[62] Some persons describe it as a wave ascending or descending along the esophagus. It is suggestive that the hysterical, who are supposd to suffer most from globus, often exhibit the most pronounced symptoms of intestinal antiperistalsis.

A FEELING OF FULNESS AFTER TAKING A FEW MOUTHFULS OF FOOD

In rare cases this will be due to shrinkage of the stomach, brought about by extensive carcinoma or ulcer. Ordinarily, persons with this symptom will be found to have large or even baggy stomachs. Carlson's experiments agree with those previously reported in showing that the sensation of fulness does not originate in the gastric mucosa.[63] Leven and Barrett[64] have commented on the fact that persons who wake in the morning with the feeling that their dinner has not passed on really have empty stomachs, as shown by the roentgen ray. Similarly, Hurst[65] has found empty stomachs when the patients were sure that they were filled with gas. He found some patients with gastroenterostomy who complained of a feeling of fulness if their stomachs emptied too rapidly into the bowel. Similar distress is caused by feeding too rapidly through a jejunal fistula.

This complaint of fulness is common with chronic appendicitis, in which it is often associated with other signs of back-pressure. Just as the taking of a little food causes the terminal ileum to empty into the cecum,

52. It is not generally known that large branches of the vagus go directly to the upper part of the jejunum (Alvarez, W. C.: Am. Jour. Physiol., 1915, **37**, 276. Mackenzie: Proc. Roy. Soc., 1915, **9**, Electrother. Sect., p. 7; Jour. Anat. and Physiol., 1917, **51**, 287. Gaskell [Note 291).

53. May: Jour. Physiol., 1904, **31**, 264.

54. Heidenhain: Hermann's Handbuch der Physiologie, 1887, **5**, 1. Meyer: Ibid., **5**, 444. Miller: Jour. Physiol., 1911, **41**, 409.

55. Gault: Am. Jour. Physiol., 1917, **43**, 22-41. Drugs which act on vagus endings or ganglion cells are most effective in the sinus region (Fluck: Jour. Physiol., 1910, **41**, 64).

56. Nothnagel: Beitr. z. Physiol. u. Path. d. Darmes, 1884, 20. Cannon: Mechanical Factors of Digestion, London, 1911, p. 150. Rolleston and Jex-Blake: Brit. Med. Jour., 1903, **2**, 68.

57. Beitzke: Verhandl. d. deutsch. path. Gesellsch., 1914, **17**, 433.

58. Hirsch, E. F.: The Gastric Mucosa in Delirium Tremens, Arch. Int. Med., March, 1916, p. 354.

59. Kast: Berl. klin. Wchnschr., 1906, **43**, 947.

60. Grützner: Deutsch. med. Wchnschr., 1894, **20**, 896. Swiezynski: Deutsch. med. Wchnschr., 1895, **31**, 514. Reach: Prag. med. Wchnschr., 1902, **27**, 549. Bernheim, Albert: Movements of Intestines, THE JOURNAL A. M. A., Feb. 16, 1901, p. 429. Hemmeter: Arch. f. Verdauungskr., 1902, **8**, 59. Hemmeter believes the particles travel along the mucous membrane of the intestine. Part of this retrograde transport might be due to the movements of the villi recently described by Hambleton. It might be similar to the cleansing activities of the cilia in the bronchi (Hambleton: Am. Jour. Physiol., 1914, **34**, 446. Brinton: Cyclopedia of Anatomy and Physiology, 1859, **5**, 354).

61. Uffenheimer: Deutsch. med. Wchnschr., 1906, **32**, 1853. Dieterlen: Centralbl. f. Bakteriol., Part 1, Orig., 1907, **45**, 385. Meyer, Karl: Personal communication to the author.

62. Marshall Hall likened globus to colic, produced by conflicting waves distending the intestine between them (Lancet, London, 1857, **1**, 82). The ancients thought it was due to a wandering of the uterus up into the neck (Neuberger: History of Medicine, London, 1910, **1**, 106).

63. Carlson: The Control of Hunger in Health and Disease, Chicago, 1916, p. 111.

64. Leven and Barrett: Arch. d. mal. d. l'app. digestif., 1907, **1**, 142.

65. Hurst: The Sensibility of the Alimentary Canal, London, 1911, pp. 22, 28.

a failure of this emptying to take place may delay the emptying of the stomach and duodenum, and may, I believe, cause this feeling of fulness.[66]

BILIOUSNESS

It is well known by thinking physicians today that we have no reason for ascribing this syndrome to hepatic insufficiency. It has probably derived its name from the fact that these persons often find bile in regurgitated or vomited material. It has already been pointed out that the presence of a certain amount of bile in the stomach is normal, and any excess would not indicate disease of the liver so much as an increase in reverse peristalsis. Persons who get severe "bilious" attacks with vomiting, nausea, regurgitation of bile, coated tongue, headache, etc., will, I think, be found ordinarily to have a chronic appendicitis. Their symptoms are really those of reversed intestinal activity.

The relief that these persons may derive from a dose of calomel is not due to any action on the liver,[67] but, I believe, to a restoration of the normal currents down the tract. In milder cases, the back-pressure may be due to constipation—the current cannot go forward, so it tends to be reversed. It seems to me that a laxative brings instant relief, not by clearing out toxins, but by removing the material which was obstructing and irritating the colon.

CONCLUSION

An attempt has been made to explain a number of gastro-intestinal symptoms in the light of recently acquired physiologic knowledge. I believe that the underlying cause of all of them is a reversal of the currents in the tract. Thus, vomiting is often due to reverse peristalsis in the intestine; regurgitation is a mild form of vomiting; heartburn is due to the regurgitation of gastric juice into the upper esophagus; belching is closely akin to regurgitation; nausea is probably one of the ways in which we perceive reverse peristalsis; "biliousness" is the common name for the reverse peristalsis syndrome; a coated tongue and foul breath are often the results of regurgitation; globus is due to reverse waves in the esophagus, and the feeling of fulness after taking a few mouthfuls is often due to back-pressure in the intestine.

Those who may feel that I have appropriated nearly all of the gastro-intestinal symptoms for this syndrome are asked to remember that if, as seems likely, symptoms are produced almost entirely by disturbances in the motor functions, we should be most conscious of, and most annoyed by, the severest possible form of such disturbance, namely, a reversal of the current.

The question may also be asked, If reverse peristalsis is so common, why do we not see more of it with the roentgen ray? Moreover, how can signs of reverse peristalsis appear from time to time during the progress of digestion, when food is actually going down the tract? First, it must be remembered that most of the disturbances are due probably to ripples coming up the tract. Any oarsman knows that a wave will not carry his boat more than a few feet unless he is very near a shelving beach. My records have shown that ripples can come down the intestine long distances without forwarding the contents, and can then break into strong waves which rush material along before them. I see no reason why similar ripples cannot travel upward in the wall of the bowel until they show themselves as waves in the stomach and esophagus. When the gradient of forces in the tract is poor, waves can probably travel in either direction. When the stomach is full and active, it will be easier for waves to proceed aborally; when the stomach and small intestine are empty and the colon is full, the waves will more easily ascend. Moreover, animal experiments indicate that the gradient may not be upset to the same extent in all parts of the tract, so that, for instance, reverse waves might be present in the stomach, and normal ones in the bowel. Similarly, the heart that is beating with nodal rhythm sends the blood in the proper direction, although the ventricles are contracting before the auricles. It is conceivable that ripples can ascend the digestive tract even when the gradient is not reversed. To explain what I mean, I will point to the case of a large river like the Missouri, which undermines its banks in places until tons of earth tumble in. In the lower stretches of the river, where the current is not rapid, such a commotion might cause ripples to run a quarter of a mile uphill, and over water flowing in the opposite direction.

Another reason why we cannot expect to see much reverse peristalsis with the roentgen ray is that even normally we cannot follow the food in the small intestine after it leaves the duodenum, and before it reaches the terminal ileum. Actual reverse transport of material has been observed in those parts of the tract which are accessible to roentgenographic study. Twice I have seen definite reverse peristalsis in stomachs free from organic disease. Subsequent operation revealed the cause to be, in one, appendicitis, in the other, duodenal ulcer. More important than visible reverse waves are the reversed impulses that hold back the barium here and there in the tract, in spite of the fact that the muscle is active, and the tube ahead is unobstructed. These are the conditions we see every day.

Many physicians today are satisfied when they have appropriately labeled each case as a "gastritis," a "hyperacidity" or a "biliousness." Their work then ends, as each label carries with it a certain string of prescriptions and, perhaps, a diet. I believe that this paper will have been well worth writing if it helps at all in making men dissatisfied with some accepted ideas, and more inclined to think in terms of disturbed physiology. Such thinking must make for better therapeutics. The physician will more often seek for and find the lesion that is irritating the bowel and giving off the reverse waves. More often, also, will he see the hopelessness of medical "tinkering," and will call in the surgeon at once. If such radical treatment is inadvisable or impossible, he will use a smooth, cellulose-poor diet, which will flow more easily along the impaired gradient. He may, perhaps, be able to improve the gradient by resting and overfeeding the patient. Later, when the pharmacologist gets to thinking along these lines, he may find for us drugs which will restore the downward currents, either by increasing the activity of the upper part of the tract or by decreasing the activity of the lower parts. I hope soon to publish the report of work indicating that some laxatives do alter the gradient in these ways.

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66. Alvarez, W. C.: The Motor Functions of the Intestine from a New Point of View, THE JOURNAL A. M. A., July 31, 1915, p. 388, Note 66.

67. All pharmacologists agree that calomel is not a cholagogue.

THE TREATMENT OF LEUKORRHEA WITH LACTIC ACID BACILLI*

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It is our purpose to give a brief summary of the experiences that we have had in the treatment of leukorrhea by means of the local application of lactic acid bacilli. Our work has extended over a period of two years, which we regard as a sufficient length of time thoroughly to digest our results, and separate the wheat from the chaff of overenthusiasm. Much has previously been done by other investigators in the search for a cure in obstinate cases of leukorrhea, and although we shall not quote the work of others, we gladly give credit and priority wherever it may be due.

Normally, in the healthy adult virgin, the reaction of the viginal secretion is acid, as a result of the activity of the bacillus of Doederlein. In the patient who is suffering from chronic leukorrhea, however, with the exception of one type, of which we shall speak later, the reaction of the vaginal secretion is distinctly alkaline. After observing these facts in a large series of cases, we formulated the theory that if we could change the reaction of the vagina from alkaline to acid, and maintain an acid reaction, we might be able to control or, perhaps, cure the leukorrhea.

The use of chemicals, drugs and douches was immediately discarded from our work, for the reason that previous experience had shown them to be but ephemeral in effect, and utterly inadequate, so far as anything like a lasting result is concerned. Believing that the alkaline reaction of the vagina in cases of leukorrhea was due to the activity of saprophytic bacteria, which in their proliferation completely killed the normally present Doederlein bacilli, we felt that if we implanted into the vagina a nonpathogenic, acid-forming organism, we could overgrow these saprophytic organisms, and our problem would be solved. At this point let us state that, although our results have been encouraging in many ways, the problem proved to be entirely different when put to a practical test.

Although many organisms might have been used in this work, we selected the Bulgarian lactic acid bacillus because of its accessibility, and also on account of the enthusiastic reports of its use in intestinal saprophytic conditions. Through the kindness of two pharmaceutical laboratories, we were supplied with tablets of lactic acid bacilli and bouillon cultures of the same organism. These, together with a stock culture obtained from the William Pepper Clinical Laboratory of the University Hospital, constituted the source of our supply.

In the beginning of our work we gave all the organisms an equal trial, and found that the best results were to be obtained from the use of bouillon cultures, provided the culture was reasonably fresh. As a practical measure, however, we soon learned that the use of cultures was out of the question, on account of the difficulty of always having a fresh culture on hand. In contradistinction to this drawback in the use of cultures, we found that the organisms compressed in tablet form with lactose were reasonably active and potent over periods of many weeks, provided the simple precaution of keeping the tablets on ice was observed. To satisfy ourselves that this was the case, we had several of the tablets from one laboratory cultivated and obtained living organisms. Without going into unnecessary detail regarding the various methods of application that we have employed in the development of our work, we shall, at present, merely describe the technic we employ, and then summarize the results obtained in the various types of cases treated.

TECHNIC

The patient is placed in the usual dorsal gynecologic position, and a thorough pelvic examination made, including smears, when indicated. A bivalve speculum is then inserted into the vagina, and the cervix and the upper vaginal canal exposed. The reaction of the vagina is then taken by moistening a piece of litmus paper in the vaginal secretion, after which the vagina is thoroughly cleansed of mucus and leukorrheal discharges by means of a simple alkaline spray, and the vagina is then dried with cotton pledgets. A lactic acid tablet, perferably one that is readily soluble and made with a lactose base, is placed in a medicine glass and moistened with *one or two drops* of sterile water dropped on the tablet by means of a small pipet or eye-dropper. It is important not to supply more than a very few drops of water to the tablet; otherwise the tablet will completely disintegrate and cannot be readily handled.

If the proper kind of tablet is used, and only enough water is applied to moisten it, it will attain the consistency of thick cottage cheese, and may be readily lifted in toto by a pair of forceps. It is then placed in the upper vaginal canal, and spread over the walls and on the cervix by means of the forceps. If the tablet is of the proper consistency, it will adhere to the vaginal mucosa wherever placed, and will show no tendency to run out of the vagina, as is the case with ordinary solutions. The speculum is next withdrawn half way, with its blades open, to allow the upper vaginal canal to close over the tablet that has been applied. Finally the blades are closed and the instrument is withdrawn. No tampons are applied. The patient is instructed to return in a week, and all douching is absolutely interdicted. On her return, the same technic is repeated, and she returns once a week for a reimplantation of the bacilli, until the vagina is acid—a result which in a favorable case is attained in about three or four weeks. After the reaction has become acid, no treatment is given so long as it remains so, although the patient returns at gradually increasing intervals to have the reaction taken. In favorable cases it is usually found necessary to reimplant organisms at intervals of from three to four weeks, since, after that time, the organisms seem to die, or at any rate to lose their potency. We might, therefore, state here that the treatment is seldom a permanent cure but rather a good palliative measure, requiring attention about once a month and superseding douches.

TYPES OF CASES TREATED, AND RESULTS

The cases that we have subjected to this treatment might be conveniently classified in the following groups, which we shall consider separately: vulvovaginitis of children, specific and nonspecific; endocervicitis, both simple and gonorrheal, and senile vaginitis, natural and artificial.

In the treatment of vulvovaginitis in children this method is of little avail as long as gonococci are ap-

* From the Department of Gynecology, University of Pennsylvania School of Medicine.

parently present. When, however, the gonococci have largely disappeared, the use of the lactic acid bacilli seems to be of some value in reducing the discharge and in lessening the vaginal irritation. In many cases, however, the symptoms will return on the cessation of the treatment. In the nonspecific types of vaginitis in children, the results are more encouraging and in a good percentage of the cases treated, we believe that a cure has been established. As some difficulty is often encountered in the introduction of the bacilli into the vagina of children, we have of late introduced the dry tablet into the vagina, and then injected a few drops of water, thus allowing the tablet to dissolve inside the patient. An interesting point we have noted in connection with our work with children is the fact that, before the onset of menstruation, the reaction of the child's vagina is almost constantly alkaline, whether or not disease is present; and it was with considerable difficulty that we obtained an acid reaction in some of these cases.

In the consideration of leukorrheal discharges during the childbearing period, we wish to call attention to the fact that our results were practically nil in cases in which there was a gross pelvic pathologic condition. Similarly, we have nothing encouraging to offer in the treatment of gonorrheal endocervicitis, or when cervical erosion, laceration, or another evident pathologic condition is the cause of the leukorrhea. Such conditions must be treated along the usual lines before any attempt is made to apply the lactic acid treatment. After the exclusion of such cases as we have mentioned, there will be a large number of cases in which the leukorrheal discharge is the chief symptom, and in which no definite disease can be determined. Cases of this type we have classified under the heading of nonspecific catarrhal endocervitis. They will almost uniformly present an alkaline reaction in the vagina, and, in approximately 50 per cent. of the cases, will respond to the treatment we have suggested.

Finally, we come to the consideration of senile or atrophic vaginitis, that most distressing condition which occurs in women past the menopause, characterized by a thin, yellow, malodorous, irritating discharge, and accompanied by intense itching of the genitalia, and sometimes by urinary frequency and burning. The cause of this syndrome is the lack of ovarian internal secretion, due either to natural atrophy of the glands at the time of the normal menopause, or else to their surgical removal. It is in this type of case especially that we have had our best results, and the strange fact is that these cases always show an acid reaction of the vaginal secretions. But, notwithstanding this fact, the application of lactic acid bacilli gives prompt relief, which we have interpreted as being due to the overgrowth of acid-forming saprophytes by the less irritating lactic acid bacilli.

These patients, as a rule, have no relief from douches, or local applications of the usual remedies, and wander from one dispensary to another in search of a cure. Their plight is distressing, and as most of them have been treated by many other physicians before coming into our hands, we feel particularly gratified with the results we have obtained. It must be distinctly understood, however, that we do not claim to have obtained a permanent cure in any of these cases, although we do know that many of them have gone several months without treatment and without symptoms. In the average case, it is necessary to implant the bacilli at monthly intervals, with perhaps a few months' intermission occasionally. While we shall not give actual figures, we believe that 80 per cent. of our cases of senile vaginitis, whether following the natural or the artificial menopause, have responded to this treatment.

CONCLUSION

We wish to state that this work is offered merely for what it may be worth, and we feel that in selected cases it will constitute a most effectual palliative treatment, being particularly acceptable to the patient on account of the cleanliness and convenience that are consistent with its proper execution.

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THE ALKALI RESERVE IN THE BLOOD OF PELLAGRINS*

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The incidence of pellagra in the Southern States has increased rapidly during the past ten years, but in spite of the advances which have been made in prophylaxis and in treatment, its etiology is still in doubt.

Various views have been advanced by investigators to explain the etiology of pellagra. These views may be divided into two classes: those which deal with it as a communicable disease, and those which consider it to be due to an unbalanced diet. Numerous organisms have been described as the etiologic agent, but sufficient proof has not yet been offered to justify us in accepting any of them. Two conceptions have been advanced by those who believe pellagra is caused by an unbalanced diet. One group of observers believes it is due to the lack of some essential substance in the diet, while the other considers it an intoxication due to the excessive use of some particular kind of food.

It has also been suggested that the disease may be caused by a change in the alkali reserve of the body. Thus, Fairbanks[1] says pellagra is caused by an acidosis resulting principally from phosphoric acid and purins in the blood, though he does not mention the particular kind of food which is responsible. Carmichel,[2] on the other hand, advocates the theory that pellagra is due to an increase in the alkalinity of the blood caused by the excessive ingestion of fruits and vegetables. It is, of course, well known that certain foods used in large amounts may cause a change in the alkali reserve of the body.

In view of these statements, we decided to report at this time the results obtained in a study of the alkali reserve in the blood of pellagrins.

The study was made with a series of thirty-six patients, including fatal cases, acute cases in which there was subsequent recovery, and chronic cases in which the patients were suffering from recurrences. Van Slyke's[3] method of estimating the carbon dioxid combining power of the blood plasma was used. The results are given in the accompanying tables.

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* From the Departments of Experimental Medicine and Pathology, Vanderbilt University Medical Department.

1. Fairbanks: Texas State Med. Jour., 1916, **21**, 170.
2. Carmichel: Paper read before Tennessee Medical Association, April, 1917.
3. Van Slyke: Jour. Biol. Chem., 1917, **30**, 347.

By reference to Table 1, it will be seen that all acute cases except Case 31 came within the normal limit, the average of the acute cases being 61.63 volume per cent. carbon dioxid. The five fatal cases (Cases 14, 16, 20, 31 and 32) averaged 58.6 volume per cent. The chronic cases (Table 2) give an average lower than the acute, though it is well within the normal. The average value of all cases is 59.45 volume per cent. The values for the males and females did not differ.

TABLE 1.—RESULTS IN ACUTE CASES

Case No. and Age	Color and Sex*	Carbon Dioxid Volume, Per Cent.
2—55	W—♀	66.0
3—27	W—♂	67.0
4—47	W—♀	67.0
5—16	W—♀	56.0
6—14	W—♀	59.5
7—10	W—♂	64.3
11—23	W—♀	68.0
12—56	W—♂	66.2
13—77	W—♀	64.3
14—70	W—♀	69.1
15—32	W—♀	67.1
16—30	W—♀	63.4
17—56	W—♂	65.5
18—25	W—♀	54.0
20—44	C—♀	57.9
27—36	W—♀	55.0
29—22	W—♀	57.0
31—41	C—♀	52.0
32—29	C—♀	60.0
34—40	W—♀	53.4

Average of 20 acute cases 61.63

* In the tables, ♂ indicates male and ♀ female.

The averages for the children are somewhat less than those for the adults. Most of the patients were seen at the Davidson County Pellagra Hospital, where the diet was well balanced, though high in proteins. The blood was taken from a number of the patients immediately after admission to the hospital and again at a later date. Thus we found that the change in diet and environment did not perceptibly alter the alkali reserve of the blood.

Viscosity determinations were made on the blood of seventeen patients. Traube's stalagmometer was used.

TABLE 2.—RESULTS IN CHRONIC CASES

Case No. and Age	Color and Sex	Carbon Dioxid Volume, Per Cent.
1—50	W—♂	57.0
8—65	W—♂	59.5
9—60	C—♂	67.2
10—45	W—♂	72.0
19—62	W—♂	53.0
21—12	W—♂	52.6
22—39	W—♀	58.8
23—67	W—♂	54.3
24—68	W—♂	55.4
25—55	W—♀	54.8
26—12	W—♀	56.9
28—39	W—♀	54.0
30—69	W—♂	54.0
33—68	W—♂	54.9
35—28	C—♀	56.0
36—49	W—♀	58.0

Average of 16 chronic cases 57.27

The tube was graduated so that at 20 C. (68 F.) 20 drops of alcohol would pass through in one minute. The blood was obtained by venipuncture and drawn into a sterile, dry tube. It was immediately transferred to a centrifuge tube containing dry potassium oxalate crystals in sufficient quantity to make a 1 per cent. solution. The blood was then centrifuged for fifteen minutes in a high power centrifuge, which effectively threw down all cells and platelets, leaving a clear, colorless plasma. The number of drops passing through Traube's stalagmometer in six minutes was determined, and the average for one minute taken. We found the blood from the seventeen pellagrins to be less viscid than that from twelve normal individuals. As the difference was not great, however, we do not care to make any deductions from it.

CONCLUSIONS

The alkali reserve of the blood in pellagra does not vary from normal in either the acute or the chronic cases; therefore there is no acidosis or alkalosis in pellagra.

The viscosity of the blood shows a slight variation from normal.

THE MECHANISM AND SIGNIFICANCE OF THE GUM MASTIC TEST*

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In 1915, Emanuel[1] announced a new colloidal reaction in the spinal fluid. He used gum mastic, a reagent which was very easily prepared. Of thirty tests made in psychiatric patients, there occurred complete precipitation in all the tubes in fourteen syphilitic cases (paresis, tabes and cerebrospinal syphilis). Cutting,[2] using a slightly modified technic, examined the spinal fluid of 200 psychiatric patients. Only the syphilitic patients gave positive results, but the number of tubes in which complete precipitation occurred varied. Lowrey[3] obtained varying degrees of precipitation in twenty different paretic fluids, as well as a few positive results in nonsyphilitic patients.

The present study was undertaken to determine whether different "curves" occurred in cerebrospinal syphilis, tabes dorsalis and paresis, but owing to the apparently irregular results, was extended to determine, if possible, the mechanism of the gum mastic reaction, as well as the examination of syphilitic and nonsyphilitic spinal fluids. Cutting's technic[2] was used. Briefly it is as follows: A solution of gum mastic is suspended in alcohol and distilled water. This is the reagent. It is precipitated by 1.25 per cent. sodium chlorid, but if a small amount of potassium carbonate is added, there is no precipitate unless protein, certain salts in certain concentration, or a pathologic spinal fluid is also added. In the test, therefore, the reagent, the spinal fluid in various dilutions, and the sodium chlorid and potassium carbonate are mixed. The gum mastic reagent is a pearly translucent fluid. With pathologic spinal fluids, or other substances which alter the mastic reagent, the following changes may occur: (1) loss of translucency without any distinct precipitate; (2) varying degrees of precipitation, without any clear supernatant fluid; (3) large amount of precipitation, with partly or entirely clear supernatant fluid. In the tables, therefore, "clear" refers to a maximum amount of precipitation.

* From the McManes Laboratory of Experimental Pathology, University of Pennsylvania School of Medicine.

1. Emanuel G.: Eine neue Reaktion zur Untersuchung des Liquor cerebrospinalis, Berl. klin. Wchnschr., 1915, **52**, 781-804; abstr., THE JOURNAL A. M. A., Sept. 4, 1915, p. 908.

2. Cutting, J. A.: A New Mastic Test for the Spinal Fluid, THE JOURNAL A. M. A., June 16, 1917, pp. 1810-1812.

3. Lowrey, L. G.: Mastiche and Potassium Permanganate Tests Applied to Cerebrospinal Fluid of Insane, Boston Med. and Surg. Jour., 1917, **177**, 115; abstr., THE JOURNAL A. M. A., Aug. 11, 1917, p. 489.

The following experiments were performed:

1. Various dilutions of normal blood serum in physiologic sodium chlorid solution (from 0.3 to 16 per cent. blood serum) yields at once the important fact that a given percentage of blood serum always caused the same degree of precipitation of mastic. This is shown in Table 1. For example, the fourth tube of a 10 per cent. solution of blood serum, containing 0.31 per cent. serum, gives a "clear" reaction. The third tube of a 5 per cent. solution of blood serum, containing tubes will contain the most precipitate or be clear; with low amounts of proteins, the beginning tubes will contain the most precipitate or be clear. (The amount of protein must not be too large or too small to cause no precipitation.) An example follows: With 10 per cent. blood serum, Tubes 4 and 5 were clear, and Tubes 1, 2 and 3 contained precipitate but no clear supernatant fluid; with 2.5 per cent. blood serum, Tubes 2, 3 and 4 were clear, and Tubes 1 and 5 were not entirely clear; with 0.6 per cent. blood serum, Tubes 1 and 2

TABLE 1.—RESULTS OF EXPERIMENTS*

Percentage of Blood Serum	Percentage of Blood Serum in Each Tube									
10	2.5 ppt +++	1.25 ppt +++	0.62 partly clear	0.31 clear	0.15 clear					
5	.....	1.25 ppt +++	0.62 partly clear	0.31 clear	0.15 clear	0.07 clear				
2.5	.....	.....	0.62 partly clear	0.31 clear	0.15 clear	0.07 clear	0.03 almost clear			
1.25	.....	.....	.....	0.31 clear	0.15 clear	0.07 clear	0.03 almost clear	0.019 ppt ++		
0.625	.....	.....	.....	.....	0.15 clear	0.07 clear	0.03 almost clear	0.019 ppt ++	0.009 almost no precipitate	
0.3125	.....	.....	.....	.....	.....	0.07 clear	0.03 almost clear	0.019 ppt ++	0.009 almost no precipitate	0.004 loss of translucence
16	4 ppt +	2 ppt ++	1 ppt +++	0.5 partly clear	0.25 clear					
8	.....	2 ppt ++	1 ppt +++	0.5 partly clear	0.25 clear	0.12 clear				
4	.....	.....	1 ppt +++	0.5 partly clear	0.25 clear	0.12 clear	0.06 clear			
2	.....	.....	.....	0.5 partly clear	0.25 clear	0.12 clear	0.06 clear	0.03 almost clear		

* It will be noted that with certain optimum percentages of protein a maximum precipitate is obtained. The types of reactions therefore fall into three groups: Type 1, large quantity of protein, in which the end tubes contain the most precipitate or are clear; Type 2, intermediate quantity of protein, in which all the tubes are clear, or in which the middle tubes are clear or contain the most precipitate; Type 3, small quantity of protein, in which the beginning tubes contain the most precipitate or are clear. Ppt, precipitate; clear, maximum precipitate, with therefore clear supernatant fluid.

TABLE 2.—TYPE 1, LOWEST AMOUNT OF PROTEIN, MOST PRECIPITATE IN BEGINNING TUBES

Colloidal Gold Reaction	Diagnosis	Mastic Reaction	Globulin Percentage	Wassermann Reaction
	Blood serum, 0.3%	Tube 1, clear; 2, almost clear; decreasing precipitate in other tubes	From 0.2 to 0.6 Blood serum, 0.3%	
5555552100	Tabes dorsalis 1	None clear; decreasing precipitate toward end tubes.	Tabes dorsalis 1	Weakly positive
5555531000	Paresis 3	None clear; decreasing precipitate toward end tubes.	Paresis 3	Positive
4-4-4-2+200000	Poliomyelitis 2	None clear; decreasing precipitate toward end tubes.	Poliomyelitis 2	Negative
5-5-5-2+2-00000	Poliomyelitis 1	Tube 1, almost clear; decreasing precipitate in other tubes	Poliomyelitis 1	Weakly positive
	Blood serum, 0.6%	Tubes 1, 2, clear; 3, almost clear; decreasing precipitate in other tubes	Blood serum, 0.6%	
5555521000	Paresis 4	Tubes 1, 2, clear; decreasing precipitate in other tubes	Paresis 4	Positive
	Blood serum, 1.25%	Tubes 1, 2, 3, clear; 4, almost clear	From 0.6 to 1.6 Blood serum, 1.25%	
5555520000	Paresis 1	Tubes 1, 2, 3, clear; 4, 5, somewhat clear	Paresis 1	Positive
5555542000	Paresis 5	Tubes 1, 2, 3, 4, clear; 5, almost clear	Paresis 5	Positive

a similar percentage of serum, gives a similar result. Moreover, an examination of this table shows that a certain optimum percentage of serum is necessary to cause a maximum precipitation ("clear"). Above this optimum amount of serum, the amount of precipitation is in inverse proportion to the amount of serum present, and below the optimum, the amount of precipitation is in direct proportion to the amount of serum present. From this it follows that, according to the amount of serum present, three types of reactions will be obtained: With large amounts of protein, the end tubes of the series will contain the most precipitate or be clear; with intermediate amounts of proteins (in which the optimum reaction usually occurs) the middle were clear, 3 was almost clear, and Tubes 4 and 5 contained precipitate, but no clear supernatant fluid. Sodium chlorid in solution, in amounts equal to that used in the dilutions of blood serum, caused no change in the mastic reagent.

2. Spinal fluids from various pathologic sources were tested with the mastic reagent. At the same time the globulin percentage of these spinal fluids was estimated in the following manner: The protein in 0.2 c.c. of various known dilutions of blood serum was precipitated by Noguchi's butyric acid method and allowed to settle a sufficient length of time (or centrifuged). These tubes were used as standards. The amount of protein precipitated by Noguchi's method in 0.2 c.c.

of spinal fluid and allowed to settle an equal length of time as in the standard tubes was compared with the amount in the latter. This was a crude method, but the readings were satisfactory for the purposes of this study. In addition to the mastic and globulin tests, a Wassermann reaction, a colloidal gold reaction[4] and a cell count were performed on each fluid. The following fluids were tested:

(*a*) Cerebrospinal meningitis, six fluids. In these the meningococci were demonstrated; the Wassermann reaction was anticomplementary in five, and negative in the remaining fluid.

(*b*) Poliomyelitis, two fluids. These were doubtful cases; the Wassermann reaction in one case was negative, in the other weakly positive; the colloidal gold readings were atypical of poliomyelitis.

(*c*) Paresis, seven fluids. The Wassermann reactions in all were positive, the colloidal gold reactions all typical.

(*d*) Tabes dorsalis, two fluids.

(*e*) Cerebrospinal syphilis, three fluids.

The Wassermann reactions in *d* and *e* were positive. In view of the colloidal gold readings in these five cases, a brief description of them is merited:

CASE 1 (Tabes dorsalis 1).—The patient has been in the Philadelphia Hospital for the Insane since 1894. He is a fairly advanced though apparently nonprogressing case of tabes dorsalis.

CASE 2 (Tabes dorsalis 2).—In this, a case of five years' duration, there are no symptoms of paresis.

CASE 3 (Cerebrospinal syphilis 1).—Symptoms of bulbar palsy began prior to 1914, how long before 1914 cannot be said.

CASE 4 (Cerebrospinal syphilis 2).—The patient is 62 years old and shows no mental loss. He has had hemiplegia of nineteen years' duration, with epileptiform convulsions of two years' duration.

CASE 5 (Cerebrospinal syphilis 4).—The patient has partial optic atrophy. He had an attack of mania in 1914 followed by a lucid interval, another attack of mania in 1916 followed by a lucid interval, an attack of melancholia early in 1917, and is now somewhat maniacal.

The Achilles tendon and patellar tendon reflexes in the three cases of cerebrospinal syphilis are exaggerated. It will be noted that the spinal fluids in these five cases (tabes and cerebrospinal syphilis) yielded a typical paretic curve. It has been previously pointed out that nonparetic patients and even patients who are not likely ever to become paretic may give a paretic curve with the colloidal gold test.[5]

The results of the mastic tests are shown in Tables 2, 3 and 4. These tables show that no matter what the pathologic source of the spinal fluids, the mastic reactions depend on the amount of globulin present. As with blood serum, the type of reaction falls into three groups, according to the amount of protein present. In Table 3 it is seen that three cases of cerebrospinal syphilis, three cases of cerebrospinal meningitis, one case of tabes dorsalis, and two cases of paresis yielded similar reactions. Normal spinal fluid caused no change in the mastic reagent, or occasionally a loss of translucence in one or two tubes.

TABLE 3.—TYPE 2, INTERMEDIATE AMOUNT OF PROTEIN, MOST PRECIPITATE IN MIDDLE TUBES

Colloidal Gold Reaction	Diagnosis	Mastic Reaction	Globulin Percentage	Wassermann Reaction
	Blood serum, 2%	Tubes 2, 3, 4, clear; 1, 5, not entirely clear	From 1.6 to 2.5 Blood serum, 2%	
5555542100	Cerebrospinal syphilis 4	Tubes 2, 3, clear; 1, 4, not entirely clear	Cerebrospinal syphilis 4	Positive
5555411000	Cerebrospinal syphilis 1	Tubes 2, 3, clear; 4, not entirely clear	Cerebrospinal syphilis 1	Positive
00014-4-1000	Cerebrospinal meningitis 2	Tubes 3, 4, clear; 2, 5, not entirely clear	Cerebrospinal meningitis 2	Negative
0001244200	Cerebrospinal meningitis 7	Tubes 2, 3, 4, clear; 1, 5, not entirely clear	Cerebrospinal meningitis 7	Anticomplementary
5555541100	Paresis 2	Tube 3, clear; 2, 4, not entirely clear	Paresis 2	Positive
00013-3-1000	Cerebrospinal meningitis 5	Tubes 2, 3, clear; 1, 5, not entirely clear	Cerebrospinal meningitis 5	Anticomplementary
5555542100	Tabes dorsalis 2	Tubes 2, 3, clear; 1, 4, not entirely clear	Tabes dorsalis 2	Positive
5555542100	Paresis 7	Tubes 2, 3, clear; 1, 4, not entirely clear	Paresis 7	Positive
5555542100	Cerebrospinal syphilis 2	Tube 2, clear; 3, 4, not entirely clear	Cerebrospinal syphilis 2	Positive

TABLE 4.—TYPE 3, HIGHEST AMOUNT OF PROTEIN, MOST PRECIPITATE IN END TUBES

Colloidal Gold Reaction	Diagnosis	Mastic Reaction	Globulin Percentage	Wassermann Reaction
	Blood serum, 8% Blood serum, 5%	Tubes 4, 5, clear; 3, somewhat clear Tubes 3, 4, 5, clear; 2, somewhat clear	From 8 to 5 Blood serum, 8% Blood serum, 5%	
0001331000	Cerebrospinal meningitis 1	Tubes 3, 4, 5, clear	Cerebrospinal meningitis 1	Anticomplementary
	Blood serum, 3.5%	Tubes 3, 4, 5, clear; 2, almost clear	From 5 to 3 Blood serum, 3.5%	
00013*3*1000	Cerebrospinal meningitis 6	Tubes 4, 5, clear; 3, almost clear	Cerebrospinal meningitis 6	Anticomplementary
0013310000	Cerebrospinal meningitis 3	Tubes 3, 4, 5, clear; 1, 2, almost clear	Cerebrospinal meningitis 3	Anticomplementary
5555541100	Paresis 6	Tubes 2, 3, 4, 5, clear; 1, almost clear	Paresis 6	Positive

CONCLUSIONS

1. The amount of precipitation in the gum mastic reaction depends on the quantity of globulin present in the spinal fluid tested. The maximum precipitation is obtained with an optimum amount of globulin.

2. The reaction obtained does not determine whether the fluid is syphilitic or nonsyphilitic.

4. I am indebted to Dr. S. F. Hogue of the Pepper Laboratory for the colloidal gold tests.

5. Immerman, S. L.: Herpes Zoster in Tabes Dorsalis and General Paralysis of the Insane, THE JOURNAL A. M. A., June 2, 1917, pp. 1607-1609, Footnotes 16 and 17.

3. The gum mastic test is not equivalent to or supplementary to the colloidal gold reaction.

4. As a clinical test, the information obtained from the gum mastic reaction can be obtained by much simpler means.

Thirty-Fourth and Pine Streets.

BUTTER AS A VEHICLE OF INFECTION IN TYPHOID*

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Very little reference is made in medical literature to the possibility of the transmission of infective agents through butter. Fewer still are reports of actual dissemination of disease by this agency. Rosenau, Frost and Bryant[1] found *Bacillus coli* in six, streptococci in fourteen and the tubercle bacillus in two of twenty-five samples of market butter collected in Boston. Swithenbank and Newman[2] cite several investigations in which the tubercle bacillus was found in the butter examined. H. W. Hill[3] reports a rural outbreak of diphtheria in which the epidemiologic evidence indicated that distribution of the diphtheria bacillus had been effected through the consumption of butter from a local creamery which had been receiving cream from premises on which existed a case of diphtheria. Hiil also reports[4] an outbreak of from thirty-five to forty cases of typhoid localized to one ward in Anoka. The only discoverable medium of infection was country butter, retailed at a local grocery and made at a farm during the course of an unrecognized case of typhoid.

No other reports have come to my attention in which butter has been considered the medium by which pathogenic organisms were disseminated.

Zae Northrup[5] has studied the influence of the products of lactic organisms on *Bacillus typhosus*. She finds that the minimum acidity produced by *Bacterium lactis-acidi* which will destroy the typhoid bacillus corresponds to 80° acid in milk and 28° acid in whey. *Bacterium bulgaricum* has less effect, requiring the production of 208° acid in milk or 60° acid in whey to exert the same effect. She finds that the time required for inhibition to take place is in inverse proportion to the minimum acidity producing inhibition. The influence which the other species of bacteria that may be present in milk exert on lactic fermentation prevents any very definite conclusions from being drawn from her experiments. Northrup quotes Boethel, who states that "in butter, typhoid bacteria are found after ten days, especially in butter which is strongly acid, as this enclosed sour brine is a good nourishing medium." She also states that Bassenge, as well as Behla, says that when milk, butter, etc., contain 0.4 per cent. lactic acid, typhoid bacilli are killed within twenty-four hours, although Frankel and Kister found them living even after forty-eight hours.

The meager data available prompt the reporting of the following two outbreaks, in the first of which the epidemiologic evidence implicating butter is quite conclusive, though in the second, the evidence, while suggestive, is not sufficient to be conclusive.

FIRST EPIDEMIC

Township X is located in the northeastern portion of Iowa, and is altogether rural. In 1915, it had a population of 894, including the 353 persons of the village of Y, in which is situated a creamery. In the dairy farming districts, the practice of churning in the farm home is at present quite obsolete, not being carried on even to secure the butter needed for home consumption. Table butter is secured from the creamery to which the fresh cream or whole milk is sold.

Township X has heretofore been reasonably free from typhoid fever. During August, 1917, seven cases developed between the 12th and 21st and, September 2, one additional case, in which the prodromal period was prolonged, was recognized. Two of these patients lived in the village of Y, and the remainder were scattered widely in the country. The eight cases occurred in six homes, two country homes having two cases each. The last four cases occurred so close together as to indicate simultaneous infection from the same source. Five were females, and three males. Three were between 15 and 20 years of age, two between 20 and 50, and three were over 50 years of age. The occurrence of several cases in one locality, with closely approximated dates of onset, indicates that infection had probably been contracted from a common source at approximately the same time.

None of the patients had been away from home except on trading trips to nearby towns which were free from infection. Careful and detailed inquiries failed to elicit any information concerning opportunities for the contraction of infection through contact, from food or drink consumed away from home, or from foods purchased at retail and brought into the home. The only food brought into these homes at the probable time of infection was butter produced in the local creamery at Y, and consumed by all the patients. Five of the victims were heavy consumers of fresh buttermilk from the same creamery. They were all considered the heavy butter users of their respective housholds. Twenty-nine persons, including the patients, lived in the six invaded households. In no discoverable particular had these households any common association that would account for the introduction of typhoid bacilli, excepting the butter.

Meanwhile, in a home in an adjoining township, there existed a case of typhoid in which the patient had taken to bed, July 31. From these premises cream was sold to the creamery in Y until August 23. In the early stages of the illness of this patient, proper care in the collection and disposal of the discharges from the patient was not exercised. I was informed, for instance, that undisinfected feces was permitted to stand outdoors for long periods, accessible to flies. During this time, four contact cases developed on the premises, and three other cases in the immediate neighborhood which could be ascribed only to carelessness in the disposal of infective material. After this patient had been sick about a week, a competent nurse was installed.

In the creamery at Y, the cream is not pasteurized before ripening or churning, being usually churned the day following its receipt. Although most of the

* From the Department of Pathology and Bacteriology, State University of Iowa College of Medicine.

1. Rosenau, M. J.; Frost, W. D., and Bryant, R.: Jour. Med. Research, 1914, **30**, 69.
2. Swithenbank and Newman: Bacteriology of Milk, p. 220.
3. Hill, H. W.: Third Biennial Report, Minnesota State Board of Health, 1911, p. 203.
4. Hill, H. W.: Fourth Biennial Report, Minnesota State Board of Health, 1913, p. 240.
5. Northrup, Zae: Tech. Bull. 9, Michigan Agric. Exper. Station.

butter is packed for shipment to a commission house in New York City, a small amount of fresh butter is returned to the patrons furnishing cream, and is also sold in the stores in Y.

The epidemiologic evidence clearly indicates that at some time in early August, an infected lot of cream was sent from the foregoing premises to the creamery at Y. Here it was churned, and a small amount of the butter and buttermilk from that churning was distributed in X township.

SECOND EPIDEMIC

P is a thriving town in south central Iowa, having a population of 1,324 in 1915. The town and adjacent countryside is largely populated by Hollanders. In September and October, 1915, eight cases developed in P, and two in the adjacent countryside. One case had occurred during July.

Of the epidemic cases, eight patients had been out of town during the month preceding their illness, but while out of town their exposure to contact infection could not be learned. Patients 2, 6 and 9 had been to the state fair at Des Moines. Patients 3 and 10 had been in the country adjacent to P. Patient 8 had been to Oskaloosa twice, September 15 and October 14, and Patient 11 had returned from San Francisco, August 21.

The other cases, classified according to the dates on which the patients took to bed, are as follows: September 12, two cases; September 14, three cases; September 26, one case; October 3, one case; October 10, two cases; October 24, one case. It is therefore seen that the outbreak was not explosive in character, but covered an extended period of time. From these data it might appear that the cases were not due to the use for a brief period of a common active route of infection.

Of the ten patients, nine were females and one was a male. It will be further noticed that the cases were all among adults or young adults, the youngest, in Case 5, being 14 years old. This is a rather unusual distribution of cases, and the preponderance of cases in adult females is noteworthy.

Classified according to occupation, the patients are thus grouped: housewife, 10, 11 and 1; clerk, 1; telephone operator, 2; college student, 6 and 8; school girl, 5; farmer, 9; at home, 3. There is no preponderance of cases among members of any single occupation. The home sanitation of all cases developing in P was good.

Patients 1, 7 and 9 said their health previous to the attack had been poor. This might possibly indicate that infection took place somewhat earlier than would be judged from the date of taking to bed. The other patients considered their previous health good.

Contact infection seems possible only with Patient 5, who lives next door to Patient 6. No history of contact was obtainable in any of the other cases.

Three patients were sole users of the city water and four used it occasionally. These were Patients 2, 11, 6, 9, 1, 5 and 8. Three (10, 7 and 3) used water from private wells exclusively. A consideration of the distribution of the residence of these patients, the time of onset and their ages and sexes does not indicate that drinking water is responsible for the outbreak.

One patient used condensed milk, two used milk from their own cows, three denied the use of milk, and four used milk from three separate sources. It is evident that milk can be excluded as a source of infection.

Nine people had eaten ice cream at several different places: four (1, 2, 6 and 8) at W; six (2, 3, 5, 6, 7 and 8) at X; three (3, 6 and 8) at Y, and three (4, 8 and 10) at other places. Patient 9 denied the use of ice cream, and Patient 11 was uncertain. The ice cream sold at W, X and Y is manufactured at different places.

All patients had ordinarily secured their meals at home previous to their illness, but eight patients (1, 2, 6, 7, 8, 9, 10 and 11) had eaten at a church social given by the R church, August 26. Patients 1, 2 and 11 had secured meals at three different restaurants in P, and Patients 3 and 4 had eaten in the country. This church social seems to be the only possible common place of infection, but it seems remarkable, even if infection was contracted there, that Patients 1, 7 and 8 would be five and six weeks in the incubation stage of the disease. It should further be noted that Patients 1 and 7 state that their previous health had been poor, which might indicate nevertheless, that recognition of typhoid was delayed. Among other foods served at the church social were potato salad, chicken sandwiches and ice cream. Patients 1, 2, 7, 9 and 11 ate both potato salad and chicken sandwiches. Patient 8 denied eating anything besides ice cream, and Patient 10 died before the investigation. We have endeavored to find the sources from which were donated the potato salad and the chicken, but so far have been unsuccessful. The ice cream served came from Z, as did also a portion of the butter. Water was not served.

This social had a very large attendance, which was estimated as high as 500. It will thus be seen that probably a little over 1 per cent. of its patrons subsequently developed typhoid. It should be further noted that Patients 5 (contact) and 3 did not attend.

Five patients (2, 3, 4, 6 and 8) used butter from Z, at their homes, and three (1, 7 and 9) used butter from various sources, including Z, in the month preceding their illness. Patient 5 did not use Z butter.

Butter from Z is thus the only common ascertainable medium of infection for those patients who attended the church social and those who did not. The Z butter used at the church social was only one fifth of the total amount of butter used. If some article of food at the social had been the medium of infection, in view of the large attendance, we could ordinarily expect a much larger percentage of cases occurring among those who had eaten there. Furthermore, the incubation period in certain of the cases is long, if the church social is considered the place where infection was acquired. We have been unable to ascertain if the church social patients used Z butter, although it is known that this butter was served.

It was learned that on August 21, the manufacturer of Z butter had purchased thirty-nine pounds of cream from J. V., whose wife had typhoid fever in March and April, 1915. This was the second attack of typhoid which Mrs. J. V. had sustained, having experienced the first while a girl of 3 in Holland. This cream had been churned, with other cream, August 23, without pasteurization before ripening. The butter made from it could therefore have been in the local market by the date of the church social. Efforts were made to secure specimens of the feces of Mrs. J. V. for laboratory examination, but these were refused.

The possibility of transmission by means of butter is therefore the most definite evidence we were able to secure from the second outbreak. Those in charge of the church social were not particularly willing to furnish the desired information.

COMMENT

Milk and cream are very suitable mediums for the multiplication of the typhoid bacillus, particularly in the warmer months, but with the gradual increase of lactic acid in the souring or ripening, the typhoid bacilli undergo a gradual diminution in numbers. If we assume that a certain lot of sweet cream did become infected, what might we be justified in considering the subsequent chain of events? With souring, the typhoid bacilli undergo a gradual reduction in numbers. Furthermore, the infected sour cream is diluted with several times its volume of uninfected cream at the creamery. Dilution and attenuation or destruction of the infective organisms thus occurs. Furthermore, the butter made from such cream is not always immediately disposed of, but different lots may remain in storage or on the retail market for several weeks, during which time the strong salt solution in the butter may effect a further reduction of the number of typhoid bacilli present. Therefore, commercial butter would not necessarily cause an explosive outbreak of disease similar to that caused by infected milk; and, furthermore, the number of cases in proportion to the size of the infected lot of butter would be much smaller when compared with the number resulting from infected milk.

It should be noted that in neither of these instances was the cream pasteurized before ripening with a pure starter. These examples serve to indicate that pasteurization of cream for butter-making is as highly necessary from the standpoint of disease prevention as it is desirable from the standpoint of the prevention of undesirable fermentations.

TREATMENT OF SCIATICA

WITH AN ANALYSIS OF NINETY-ONE CASES *

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Sciatica, until very recently, was considered a distinct morbid entity. It was defined as a neuralgia of the sciatic nerve due to conditions within the nerve itself, or caused secondarily by organic lesions adjacent to the nerve, its roots or their origin in the cord. In the past few years, however, there has been a tendency in practically all the cases to regard the condition as secondary to some organic lesion.

Déjerine and his school have called attention to the segmentary distribution of the sensory disturbances in some cases of sciatica, and this they consider evidence that the site of the inflammation is in the roots and not in the trunk of the nerve. They have given the name of "radiculitis" to this condition. Wertheim-Salomonson asserts that one half of the cases of sciatica which he observed were due to radiculitis; he is of the opinion that most investigators overlook these cases because they fail to recognize the root type of the sensory disturbances. Many authors speak of neuralgia of the nerve, and it is probable that the indiscriminate use of this term has caused skepticism regarding the existence of sciatica as a clinical entity. A few believe with Gowers that all cases of sciatica are due to a neuritis.

It is held by others that most of the cases of idiopathic sciatica are due to lumbosacral and sacro-iliac disease and sacro-iliac subluxation. In fact, in the discussion of Rogers' paper[1] before the Section on Orthopedic Surgery at the 1916 session of the American Medical Association, some of the members went so far as to deride the idea that there could be an essential nerve inflammation. Now, while there is no question that inflammation of the sacro-iliac synchondrosis, if it is intense enough and of long duration, can cause symptoms which are indicative of irritation of the sciatic nerve or the roots entering into its formation, and although treatment of the primary condition will often remove the manifestations of sciatica, the symptoms which are caused by sacro-iliac disease are so definite that there should be no difficulty in their detection and differentiation from symptoms referable to the sciatic nerve or its roots. The same statement holds true regarding hip disease, which has been regarded by some as causative of sciatica.

As our knowledge has been obtained mainly from the appearance of the nerve when exposed at the operation for stretching, or from pieces occasionally removed at such times, little is known of the pathology of the condition. The nerve is described as being red and swollen, and marked exudation into the nerve sheath and especially into the connective tissue between the funiculi has been observed. Hemorrhages have often been found; occasionally the endoneurium is involved, and degeneration of the nerve fibers has been reported. The microscopic appearance of the nerve and even the edema may, of course, be due to the handling and exposure of the nerve during the operation. The same is true of the hemorrhages that have been found. It may very well be that the true pathologic condition responsible for this disease lies nearer the roots of the nerve, either within the vertebral canal or in parts just outside. There has been no opportunity to examine the nerve in these regions.

ANALYSIS OF CASES

My own experience has led me to believe that there exists a large group of cases in which the lesion, functional or organic, exists in the nerve itself; and in order to verify this fact, I have carefully examined ninety-one cases which have come under my care in the past years. In all these cases, definite organic lesions elsewhere could be excluded. The greater number of these patients were seen in the neurologic service of the Mount Sinai Hospital, and I am indebted to Dr. Bernard Sachs for the privilege of using this material.

The majority were between the thirtieth and sixtieth years of age; and contrary to the statistics of most authors, who give a ratio of five males to one female, the proportion of men and women was nearly equal, namely, fifty-one males and thirty-nine females.

The onset of pain was almost always gradual. The pain began in the sciatic notch or in the lower lumbar region as well, and gradually extended down the course of the sciatic nerve. In most of the cases, the pain at the beginning was not severe but rather of a dull, aching character, so that the patient paid very little attention to it. The pain was sticking, burning or lancinating in character, and radiated downward from the sciatic notch along the posterior aspect of the thigh into the calf muscles and foot. In many of the

* From the neurologic service of Mount Sinai Hospital.

1. Rogers, M. H.: An Analysis of Fifty Cases of Sciatica, THE JOURNAL A. M. A., Feb. 10, 1917, p. 425.

chronic cases it was confined to the calf muscles, principally on their outer aspect, and to the outer side of the foot, where it became persistent and caused as much discomfort as the pain in the thigh and buttock during the early stages.

The influence of posture on the severity of the pain varied. In the early stages the prone position was found to be more comfortable, but in the later stages walking appeared to give relief in some cases. There were no definite points of local tenderness.

In nineteen cases there was distinct paresthesia; in six there were areas of hypalgesia; and in seven, areas of hyperesthesia were found. Each patient was examined with the view of diagnosing radiculitis, but we were unable to detect definite sensory disturbances corresponding to involvement of the roots or segments of the spinal cord. It has been stated that the pain in radiculitis is intensified by coughing and sneezing, and in many of the cases this symptom was present. However, in the absence of definite segmentary disturbances it did not seem to us that the diagnosis of radiculitis was warranted. We found Lasègue's sign present in varying degrees of intensity in nearly all of the cases, and its intensity corresponded with the severity of the affection. In long standing cases the reflexes were always affected. The knee jerks were absent twice (which is very rare), diminished in intensity in twenty-two, and active in twenty cases. The Achilles tendon reflex was absent in ten and diminished in seven cases. Muscular atrophy was present in only eight cases, though very frequently the muscles of the affected leg were flabby. There were no other trophic changes.

The Wassermann reaction in the blood was negative in all of the cases. In sixteen cases, lumbar puncture revealed normal spinal fluids. Syphilis, therefore, can in all probability be excluded as a cause of sciatica. One case which improved under epidural injections yielded a spinal fluid which contained twenty-seven cells. This exceptional finding, together with the presence of bladder symptoms, changes in the abdominal reflexes and weakness in the affected leg, led me to conclude that the condition was not sciatica despite the good result obtained by treatment.

In twenty-eight cases, roentgen examination of the vertebral column and sacro-iliac joints was made. One showed a destruction of the fifth lumbar vertebra of unknown character, four showed mild spondylitic changes in the lumbar vertebrae, and two arthritic changes in the sacro-iliac joint.

The average duration of the illness was six months. The briefest period was three weeks, and the longest, twenty-seven months. In all the cases of this series, organic abnormalities outside the sciatic nerve itself were excluded, and the patient recovered without any treatment except that directed to the relief of the nerve symptoms.

TREATMENT OF SCIATICA

In a consideration of the treatment of sciatica, some attention to the question of prophylaxis is in order. The condition is undoubtedly more frequent during the summer months. This is probably due to the exposure of the body to drafts in order to sleep during hot nights. It is unquestionably true that individual susceptibility to climatic variations exists. Those in whom a draft seems to bring on an attack of coryza, or vague pains in the muscles which are commonly designated as rheumatic, ought to be especially careful not to subject the legs to such exposure. This holds true regarding the use of the cold plunge or of shower baths by such persons. Probably many cases of sciatica could be aborted in their early stages if patients and physicians would recognize the significance of the early pains and use remedial measures promptly.

In the early stages, rest in bed, the application of warmth along the course of the nerve, especially in the gluteal region, and the administration of large doses of the salicylates are indicated. Complete rest in bed is the one remedy on which stress should be laid. The rest, and moist heat in some form, are the two most efficacious measures in the beginning. All forms of massage are absolutely contraindicated. At this stage they always do harm. Counterirritants likewise are of little benefit. If salicylates are given, they should be administered in large doses.

The salicylates undoubtedly lessen the pain, and in my opinion also exert a beneficial effect on the inflammatory process itself. If the pain is severe, codein should be freely administered. If the attack does not yield to these measures, and especially in those cases which have lasted for weeks or months, recourse must be had to other methods.

There are two methods which have yielded good results: One is the injection of physiologic sodium chlorid solution into the neighborhood of the nerve according to the technic of Lange, and the other is the epidural injection along the lines described by Cathelin. In making perineural injections, the patient lies on the abdomen with a pillow underneath its lower part, and the feet projecting beyond the edge of the table or couch. A line is then drawn from the sacrococcygeal articulation to the lowest point of the postero-external border of the great trochanter. The point of puncture is 1 inch to the outer side of the junction of the inner one third and outer two thirds of the foregoing lines. A trocar and cannula about 20 cm. in length and 2 mm. in caliber is used in the injection. The point of the trocar ought not to project very far beyond the cannula. The needle is inserted directly downward through the gluteal muscles until the nerve is reached. When the nerve is touched, the patient feels a sharp, shooting pain down the leg, and there is very often involuntary contraction of the gastrocnemius muscles. When the nerve is struck, the trocar is immediately withdrawn, and a syringe attached to the cannula. Physiologic soduim chlorid solution is then injected in amounts varying from 100 to 150 c.c. Considerable pressure is sometimes necessary in order to force the fluid into the tissues, and in such cases, care must be taken that the needle is not forced into the nerve. Considerable pain may follow the injection, which, as a rule, subsides after an hour.

It may be necessary to repeat the injection every other day until at least five are given, but as a rule three injections suffice. Alcohol should never be used for these injections.

The epidural space in an adult begins at the lower edge of the first sacral vertebra, where the dura ends. It extends down to the sacrococcygeal articulation. At this level the injections are made. There are certain landmarks by which this opening, the foramen sacrale superius, may be identified. It lies at the end of the crest made by the spines of the sacrum. It has the shape of an inverted V or U, and is about 1 cm. wide and from 1.5 to 2 cm. in length. It is bordered laterally by two prominences, the cristae sacrales laterales, which are usually easily felt by the finger. The opening is covered by a dense fibrous ligament, the liga-

mentum sacrococcygeum. The opening lies generally 2 cm. above the end of the gluteal fold.

The needle used for the injection should be about 8 cm. in length, and 1 mm. in caliber. I have used an ordinary steel needle previously tested as to its flexibility. If greater flexibility is desired, a needle made of platinum iridium may be used; but a broken needle need cause no alarm: it will do no harm if allowed to remain in the epidural space. The needle is to be inserted to a depth of 6 cm. to reach the second sacral vertebra. There is no danger of entering the subarachnoid space, because the dura ends at about the level of the first sacral vertebra; however, to be certain that this space has not been entered, it is well to wait for a few minutes before injecting to see whether there is an escape of cerebrospinal fluid. If possible, when inserting the needle, one should place the patient in the knee-chest position in order more easily to locate the landmarks. If the injection is made with the patient lying on the side with the knees and thighs flexed, the landmarks are not so easily discerned, and the gluteal fold usually lies above the foramen. It may be difficult, if not impossible, to enter the epidural space of very stout persons, especially of stout women. In such cases, recourse must be had to the nerve injection.

It has been my custom to anesthetize the skin and tissue overlying the foramen and the ligament with novocain. In doing this, one must be careful not to cause much swelling, which might obliterate the landmarks. After the needle has been pushed through the skin, considerable resistance is met at the ligament. Once this resistance is overcome, the needle glides into the epidural space. If the patient is in the knee-chest posture, the needle is inserted into the body at an angle of 45 degrees. After it has passed through the ligament the needle is held so that it is horizontal to the body. During the injection, the patient lies on the affected side.

The injection consists of warm sterile physiologic sodium chlorid solution. To the first 10 or 20 c.c. of solution is added 0.125 gm. of novocain with epinephrin, and a few minutes are allowed to elapse after their injection to obtain the full benefit of their anesthetic effect. In all, from 60 to 80 c.c. of solution are injected at a time.

The injections are given at forty-eight hour intervals. They may be given in the office, and the patient will have no difficulty in going home. It is preferable, however, for the patient to remain in bed during the intervals. The average number of injections required is three. Occasionally it may be necessary to give five, but sometimes two or even one suffice to relieve the condition. The most difficult cases to cure are the chronic ones in which the pain is along the outer aspect of the thigh. In some instances this pain persists even after several injections, and then treating the limb with superheated air in the Tyrnauer apparatus is efficacious. The heat treatment alone in the subacute and chronic cases is of no avail. Massage ought never to be used—it appears to do more harm than good. A patient may improve after several epidural injections but not be entirely cured. The injections of sodium chlorid solution along the course of the nerve in the gluteal region may cause the disappearance of the pain. There have been no untoward results from the epidural injections. The knee jerk on the affected side has disappeared for a short time, and sometimes the patient complains of delayed micturition; but these symptoms soon disappear.

The treatment of sciatica by injection of sodium chlorid solution, whether epidurally or in the neighborhood of the nerve, offers a means of shortening the duration of this painful malady from weeks and months to days.

116 West Fifty-Ninth Street.

Clinical Notes, Suggestions, and New Instruments

THE STERILIZATION OF SURGEONS' SANITARY PAPER CAPS *

WALLACE A. MANHEIMER, PH.D., NEW YORK

Paper caps in place of linen caps for surgeons are becoming very popular for a number of reasons. They are cheap, costing less than the laundering and depreciation of linen caps, are cool and light, are automatically adjustable and are free from lint. While there are probably several types of paper hats on the market, the one which has an elastic crape paper insertion in the back is the one to be recommended because it adheres firmly to the head, preventing the dropping of dust on the wound. This hat is made over a block the shape of the head by pasting a paper band of glacine paper to a crown piece composed of any type of paper. In the back of the paper band is an elastic insert composed of crape paper which permits the hat to be stretched sufficiently to conform to heads of any size. A piece of thick corrugated absorbent paper is pasted on the inside of the paper band just where the hat touches the forehead, in order to absorb sweat. These hats make a neat appearance and have proved satisfactory.

The practice of sterilizing surgeons' caps varies considerably throughout the country, most of the leading hospitals dispensing with the practice altogether. Nevertheless, a great many surgeons require sterilized hats, and for this reason the methods which can be used for the sterilization of the paper cap are set forth below. The hat is made of a glacine paper which has high tensile strength, but must be handled carefully during sterilization.

METHODS OF STERILIZATION

1. *Hot Air Sterilization.*—At temperatures ranging from 120 to 160 C., hot air is not satisfactory for the sterilization of glacine paper, of which the hat is made. The paper becomes hard and brittle, and cannot be handled without tearing.

2. *Autoclave Sterilization.*—(*a*) At 15 to 16 pounds steam pressure for thirty minutes, the *Bacillus subtilis* spores on the threads packed in the hats are destroyed, the paper is browned, and the tensile strength and friability of the paper is only slightly impaired. No dry heat is used.

(*b*) With 15 to 16 pounds steam pressure for fifteen minutes, 10 inches of mercury vacuum with preliminary heating for fifteen minutes, the hats are sterile, slightly browned, *B. subtilis* spores are destroyed and the strength of the hat is unimpaired.

(*c*) With 10 pounds steam pressure for fifteen minutes, and a rapid release of steam, three minutes, the hats dry on removal, the color being only slightly changed. The hats are sterile, *B. subtilis* spores are destroyed, and the tensile strength of the paper is unimpaired.

3. *Flowing Steam Forty-Five Minutes in the Arnold Sterilizer.*—The hats are dried for two minutes in a hot air oven. The tensile strength is unimpaired, the hats are slightly browned, they are sterile and *B. subtilis* spores are destroyed.

CONCLUSIONS

1. Paper caps in place of linen caps used by surgeons can be sterilized, if desired, in a number of ways, but not by dry heat, which destroys the tensile strength of glacine paper.

* From the Research Laboratory, New York Department of Health.

2. The hats can stand the autoclave up to 15 pounds pressure for fifteen minutes without appreciable impairment of strength. The best method to use is low pressure (10 pounds) for fifteen minutes with rapid release of steam from the sterilizer, for the purpose of drying the hats.

3. Flowing steam for forty-five minutes, with two or three minutes in the hot air oven, sterilizes the hat (destroys *B. subtilis* spores) without impairment of the paper.

2350 Davidson Avenue.

FRACTURE REDUCTION WITH THE AID OF A SIMPLE TRACTION APPARATUS

ROBERT SOUTTER, M.D., BOSTON
Assistant Surgeon, Children's Hospital, Boston; Instructor, Harvard University Medical School

This apparatus occupies a space of 24 by 4 inches. It is convenient, therefore, for emergency fracture work at the front, or in hospitals in which a fracture table is not available. It is also applicable for the open reduction of fractures, for bone graft operations, and for plating, wiring or banding. It can be used for fractures of the shoulder, the shaft of the humerus, the elbow, the forearm, the wrist, the hip, the shaft of the femur, the knee, the tibia or fibula or both.

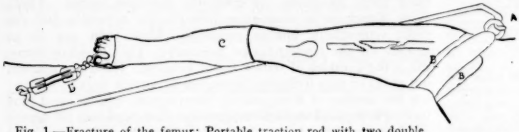

Fig. 1.—Fracture of the femur: Portable traction rod with two double block pulleys, and leather legging, *C*, applied. The rod is hooked into an iron ring at *A*. A heavy double canvas belt 4 inches broad is passed around the thigh over a folded sheet, *B*. The belt passes through the iron ring at *A*. Instead of the legging, *C*, a three strand army webbing may be passed around the ankle as shown in Figures 2 and 3. The ankle is well padded before the webbing is applied.

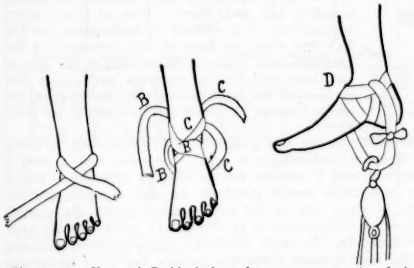

Fig. 2.—Dr. Hayward Cushing's knot for temporary traction during operations on the leg. The ankle is well padded with heavy felt passed around under the webbing. The webbing is crossed in front of the foot. The end *B* and the end *C* may be traced in the illustration. On the outside of the ankle, the end *C* crosses in front to the inside under the foot, then upward on the outside, and is looped around the original outside piece.

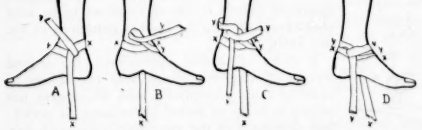

Fig. 3.—Knot used by Dr. Hawley for temporary traction on the leg. The webbing should be triple or double. It may be traced by the accompanying drawings. A heavy felt pad should be put around under the webbing.

The control of the traction is simple; it need not be removed for open operation or for the application of the dressing, splints or plaster.

Traction is applied by means of two double or triple block pulleys; one pulley is hooked to the rod, and the other to the ankle for traction on the leg. Countertraction is applied at the hip by a broad canvas belt over a folded sheet (for padding). The belt goes through a large iron ring which hooks over the traction rod.

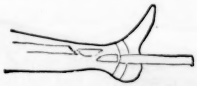

Fig. 4.—Fracture of the lower leg: Method of applying tape to the ankle, using Cushing knot (see Fig. 2).

For traction above the elbow, an army webbing strap doubled is passed over a folded pillow case (for padding) around the forearm, flexed at right angles, or a heavy pad is placed around the wrist and the webbing attached over it by one of the knots shown in the accompanying illustrations. The webbing is hooked to one pulley, and the other pulley is hooked to the rod. Countertraction is applied to the other end of the rod by means of a canvas belt passed around the chest high under the arms. The canvas belt passes through a heavy ring. The rod is hooked to this ring (Figs. 1, 2, 3, 4, 5, 6, 7 and 8). It is important to pad the webbing. The countertraction at the hip should be well padded to avoid injury to the sciatic nerve. A slip noose should not be used on the arm or leg. Several knots are suggested in connection with this method of reducing fractures; one devised by Hayward W. Cushing, and another used by Dr. Hawley.

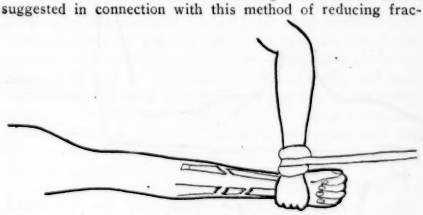

Fig. 5.—Fracture of the forearm: Traction applied to the assistant's wrist.

For open operation on the arm or forearm, the rod is placed on the operating table, a pillow over it, and the patient lies on the pillow. The exposed rod is covered with a sterile sheet allowed to hang over it. Sterile webbing is used, and a sterile pillow case folded for a wrist or a forearm pad. The pulleys and the tape are covered with sterile sheets. When the leg is prepared for operation, the rod may be covered by sterile sheets. The traction is controlled by a nonsterile assistant.

Fig. 6.—Fracture of the forearm: A pad is placed about the wrist, and the knot described in Figure 3 is applied to the wrist. This knot distributes the pressure and prevents constriction. The operator or an assistant controls the hand while traction is being made.

This apparatus is part of a larger portable traction apparatus used by me for over twelve years.[1] The apparatus consists of a rod, 8 feet long, with an offset and hook at each end. The rod is strong and jointed to make it portable.

1. Soutter, Robert: Boston Med. and Surg. Jour., 1907, **157**, 724-726; Operations on Bones, Joints, Muscles and Tendons, Ed. 1, New York, the Macmillan Company, 1917, pp. 35, 227, 229.

In a large hospital, a fracture table, such as Dr. Hawley's, leaves little to be desired.

For the satisfactory treatment of fractures, a portable traction apparatus is often necessary. The apparatus described in this article has proved of great value for use

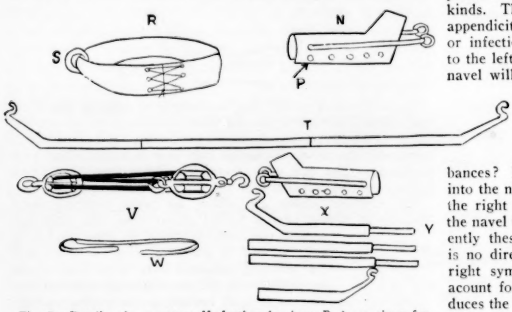

Fig. 7.—Details of apparatus: *N*, leather legging; *P*, loose rings for lacing; *R*, heavy canvas belt 4 inches broad, cross stitched with loose rings for lacing. The belt passes through an iron ring; *S*, iron ring; *T*, traction rod made from tubing; each section is 22 inches long, and there are four sections. Three iron rods 22 inches long are passed inside this tubing, and unites them into one long firm rod. *X* represents the tubing disjointed and the rods protruding; the rods may be removed for packing. *V*, double block pulley 4 inches each; *W*, webbing for ankle knot, as illustrated in Figures 2 and 3; *X*, traction rod *T* disjointed, showing how the rod *Y* may be removed from the tubing.

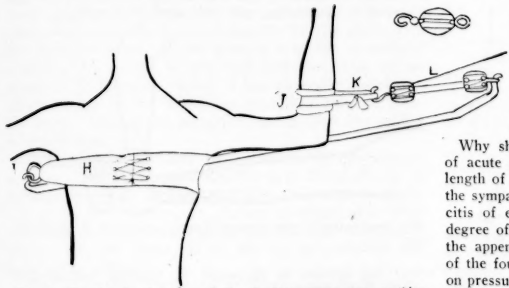

Fig. 8.—Traction for fractures of the shoulder, upper arm or elbow. If the surgeon prefers he may use the knot shown in Figure 3 applied to the wrist. The rod hooks into an iron ring at *I*; *H*, canvas belt passed through an iron ring at *I*; *J*, folded pillow case over which is passed a double army webbing *K*; *K*, army webbing hooked to pully; *L*, two double block pulleys.

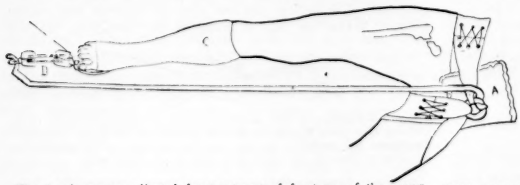

Fig. 9.—Apparatus adjusted for treatment of fractures of the femur high up. The canvas belt is applied to the other leg, and a second belt looped around the thigh portion of the first belt behind and brought around the flank double and passed through the iron ring, and then laced to itself. A piece of leather or heavy canvas is placed under the ring at *A*.

in reducing fractures and for open operations on fractures. Its size makes it especially serviceable for emergency use.

133 Newbury Street.

APPENDICITIS AND THE GYNECOLOGIST

ROBERT T. MORRIS, M.D., NEW YORK

About an inch and a half to the right of the navel and a trifle caudad, one will find on deep pressure a hypersensitive point in cases of chronic appendicitis of one of the four chief kinds. This tender point does not belong to cases of acute appendicitis. It does not belong to cases of pelvic irritation or infection, except in company with a similar tender point to the left of the navel. This tender point to the right of the navel will serve to give differential diagnosis between cases of chronic appendicitis and various pelvic irritations or infections.

Why does not this tender point to the right of the navel belong to acute appendicitis? Why does it not belong to right-side pelvic disturbances? In order to answer these questions, we must inquire into the nature of the tender point. At that site we shall find the right lumbar sympathetic ganglion. On the left side of the navel we find the left sympathetic lumbar ganglion. Apparently these ganglions represent the sensitive points. There is no direct nerve connection between the appendix and the right sympathetic lumbar ganglion. How, then, are we to acount for the tenderness on pressure? This problem introduces the question of sensorimotor synapse. Head has marked out areas of skin irritation belonging to certain organs, following the studies of Ross and of Sherrington, who showed that irritated internal organs frequently send impulses to superficial areas of the body. I postulate that the irritated appendix sends an efferent impulse to a segment of the spinal cord, and from that segment of the spinal cord an efferent impulse goes out to the skin over the area described by Head as belonging to the appendix. At the same time, a similar impulse goes out to the right sympathetic lumbar ganglion and stops there. This, at least, is my assumption. It is offered in explanation for the fact that when we have chronic irritation of the appendix there is also a disturbance of the skin in the Head zone for the appendix, and also a disturbance of the right sympathetic lumbar ganglion, which remains hypersensitive and tender on pressure.

Why should not this ganglion be hypersensitive in cases of acute appendicitis, as a rule? I assume that a certain length of time is required for the nagging appendix to excite the sympathetic lumbar ganglion. In cases of acute appendicitis of either one of the two common forms, the greater degree of sensitiveness is at McBurney's point, directly over the appendix. In cases of chronic appendicitis of any one of the four common kinds, the greatest degree of tenderness on pressure is at the point 1½ inches to the right of the navel, close to the spinal column, and corresponding to the right sympathetic lumbar ganglion. The reason this ganglion is not hypersensitive alone, but only in company with its left neighbor in cases of pelvic disturbance, is that the crossed action of the sympathetic and autonomic nerve branches between the pelvic ganglions and the lumbar ganglions causes irritative impulses to be shot simultaneously into the lumbar ganglions of the two sides.

In cases of chronic appendicitis, the second feature of diagnosis which does not belong to cases of acute appendicitis, and which does not belong to cases of pelvic disturbance, is persistent distention of the ascending colon with gas. Why should the ascending colon be distended with gas in cases of chronic appendicitis? We may assume that irritation from the nerve elements of a chronically inflamed appendix at first overstimulates the innervation of the muscularis of the ascending colon. This overstimulation, carried on for weeks or for months, eventually tires out the innervation of the ascending colon. When the innervation becomes wearied, the muscular coat of the ascending colon becomes relaxed and distended with gas, which it fails to press onward because of comparative lack of energy. This distention of the ascending colon with gas,

which belongs particularly to chronic appendicitis, I call the "cider barrel sign." If we percuss the left side of the abdomen in a case of chronic appendicitis, we shall obtain a normal resonance note suggesting percussion of the cider barrel in October. If we percuss the right side of the abdomen, we obtain a percussion note suggesting that of the cider barrel in January.

These two points, then, the "cider barrel sign" and the point of tenderness on pressure to the right of the navel, appear to be important in distinguishing between chronic appendicitis and pelvic disorders of the sort that interest the gynecologist.

616 Madison Avenue.

A METHOD FOR FILING NECROPSY SECTIONS

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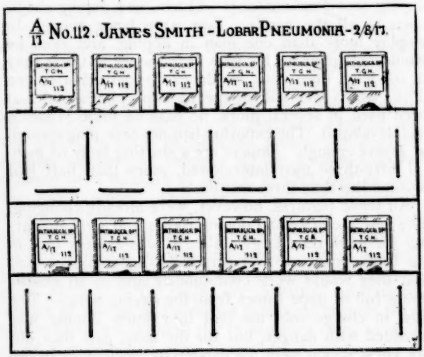
Department of Pathology, Toronto General Hospital

The ordinary methods of storing microscopic slides of necropsy sections in drawers or in boxes has always seemed to me not only an awkward method, but one which renders the sections very inaccessible. I wish, therefore, to submit the following means of adapting the ordinary filing cabinet



Adaptation of the ordinary filing cabinet to the filing of microscopic specimens of necropsy sections.

to the filing of microscopic specimens of necropsy sections in a convenient and readily accessible form.

Our filing cabinet takes a card 9¼ by 7½ inches. One of the local publishing houses furnished us with folders of this size. The paper used is 140 pound tag manilla, cut to a size 9¼ inches square. One margin is then turned over for a distance of 1¾ inches, and wire staples eleven-sixteenths of an inch long put in so as to divide the folded strip into six equal compartments. In this way a folder which is 9¼ inches wide by 7½ inches high is made. A strip of the same material 1¾ inches wide, and of the same length as the width of the folder, is stapled in position so that the lower border is 3⅜ inches above the folded lower border of the folder. This strip not only has the seven staples which divide it off into equal compartments, but also a staple at the lower part of each compartment, thus making space for the filing of twelve sections, and leaving room at the top for the number, name, date, and also a description of the principal pathologic lesion that has been revealed by the necropsy. There is sufficient room on the back of the folder for writing the complete anatomic diagnosis.

These folders are filed away in rotation, and can be cross indexed according to name and pathologic lesion. A cabinet 22 inches deep will hold about 250 of these folders when filled with microscopic slides.

Military Medicine and Surgery

INDUSTRIAL POISONING IN AIRCRAFT MANUFACTURE

ALICE HAMILTON, M.D.
CHICAGO

In the latter part of 1914, Jungfer[1] reported a new industrial disease that had appeared during the preceding year in an aeroplane factory in Johannisthal and had affected four out of a force of eight men. These men were employed in painting and spraying a solution of cellulose acetate over the linen that covers the aeroplane. All of them developed a severe acute hepatitis, and one died. Later in another factory in the same place ten men were poisoned and one died. Grimm,[2] writing shortly after, was able to give details of fifteen cases of poisoning among aircraft employees engaged in such work. The solutions used were sent to the pharmacologic institute of the University of Berlin for analysis by Heffter and Joachimoglu,[3] who reported that the toxic constituent was tetrachlorethane, of which some specimens contained as much as eighty-four in a hundred parts. They experimented on dogs, rubbing the solutions into the skin and also exposing the animals to the fumes. From the commercial mixtures and from pure tetrachlorethane they obtained the same results, namely, loss of weight, vomiting, presence of bile and blood in the urine, death with fatty degeneration of the liver, and hemorrhages into serous and mucous surfaces and in the heart muscle. In inhalation experiments narcosis came on, but was slower in appearance and less deep and lasting as the days went on, showing a gradually increasing tolerance on the part of the animals. The symptoms described above, however, put in their appearance and the course of the poisoning was the same, no matter how the compound was administered.

Tetrachlorethane had already been tested by Lehmann[4] of Wurzburg, the authority on industrial gases and vapors. As always, his experiments were for the purpose of determining the minimum dangerous amount of the vapor in air, and he found that air containing no more than 1 or 2 mg. of tetrachlorethane to a liter could be breathed for a relatively long period—six or seven hours a day for eighteen days spaced over four weeks—with no more serious result than loss of weight and drowsiness. If the fumes were stronger, narcosis came on, and after repeated exposures, serious disturbances of metabolism. In fatal poisoning he found solution of red corpuscles, basophilia, fatty liver, the heart muscle yellowish and the kidneys congested. He found it the most poisonous of the chlorin derivatives of the hydrocarbons, four times as poisonous as chloroform and nine times as much so as tetrachlormethane (carbon tetrachlorid).

The fatty degeneration of the liver as found by these German experimenters is more marked than that produced by any known substance except phosphorus, and as in phosphorus poisoning, it is associated with a yellow, flabby heart muscle, and with acute degenerative

1. Jungfer: Zentralbl. f. Gewerbehyg., 1914, **2**, 222.
2. Grimm, Heffter and Joachimoglu: Vrtljschr. f. gerichtl. Med., Series 3, 1914, **48**, supplement, p. 192.
3. Heffter and Joachimoglu: Vrtljschr. f. gerichtl. Med., Series 3, 1914, **48**, supplement.
4. Lehmann, K. B.: Arch. f. Hyg., 1911, **74**.

changes in the kidney epithelium. It also resembles delayed chloroform poisoning with its hematogenous jaundice. Tetrachlorethane is seven times as hemolytic for mammalian blood as is chloroform.

POISONING ABROAD

The first case of tetrachlorethane poisoning reported from England was in October, 1914, when a man died of acute jaundice after working in an aeroplane factory in Hendon. He had worked eleven weeks when jaundice developed, and he died after three weeks' illness. The liver was shrunken and green. Legge, chief medical inspector of factories, went there to investigate, and found that the man had been applying to aeroplanes what is called in English and American factories "dope." On examining the other dopers, Legge found ten with evidence of inflammation of the liver. They had worked from three to sixteen weeks before they were taken sick. All had gastric symptoms and jaundice. The next three deaths from what was now called "dope poisoning" were in women, two girls under 20 and a woman over 30. By February, 1916, the Home Office had had reports of forty-three cases, with seven deaths, five in women. The amount of tetrachlorethane in the dopes varied, but British factory inspectors considered even 10 per cent. dangerous.

The dopes were subjected to analysis and animal tests by Wilcox,[5] who also examined the organs of some of the victims of dope poisoning. His results were exactly the same as those of the Germans. Though the English dopes contained benzene, methyl alcohol and acetone as well as tetrachlorethane, Wilcox proved that the last was the cause of dope poisoning. He described, as the distinctive features of this form of hematogenous jaundice in man, a slow, insidious onset; long duration of the disease after the onset of jaundice, longer than in acute yellow atrophy of the liver; absence of marked fever, which distinguishes it from infectious jaundice, Weil's disease; and absence of the degree of anemia that would be found in arsenical jaundice. The jaundice is deeper than that of delayed chloroform poisoning.

The last paper on the subject of dope poisoning in Germany appeared early in 1915. Koelsch,[6] a Landesgewerbearzt of Bavaria, made a study of industrial poisoning from tetrachlorethane, and divided the cases into two classes: (*a*) those with pronounced gastrointestinal symptoms, nausea, vomiting, cramplike pain, enlarged liver and jaundice; and (*b*) those with slight or no abdominal disturbance, but with various nervous symptoms, headache, paresthesias, tremors of the hands, disordered reflexes and slight paralyses. Two cases belonging to the first group had been diagnosed as lead colic, though there had been no exposure to lead. Other symptoms noted by Koelsch were increased craving for food coincident with loss of weight, and great drowsiness, persisting all of the working hours.

After this, reports from Germany ceased to come, and we have no way of knowing whether or not the advice of the factory inspectors was followed and tetrachlorethane dope forbidden. In England this has been virtually effected. Toxic jaundice from aeroplane dope was made a reportable disease in February, 1916, and brought under the workmen's compensation act. By August, 1916, the Home Office was able to state that dopes free from tetrachlorethane were now obtainable and approved by the War Office and Admiralty. Letters from Sir Thomas Oliver and Dr. T. M. Legge, written in January of this year, assured me that tetrachlorethane dopes were no longer used in British aeroplane manufacture.

THE SITUATION IN THIS COUNTRY

That is the history of dope poisoning in the older countries. In our country, despite the fact that since the war our aeroplane manufacture has increased rapidly, no case of dope poisoning has come to public knowledge. The Bureau of Labor Statistics, knowing the serious trouble that England had experienced, and wishing if possible to forestall it here, asked me to make an investigation of our aeroplane works during the spring and summer of this year. At that time the output of these factories was largely training planes, not war planes. I visited eighteen factories, in the Middle West, Florida, New York State, New England and northern New Jersey. Everything was in a state of experiment and of rapid expansion. Many of the plants were small, temporary structures, and all the doping was done outdoors. Others had doping sheds, open to all the winds. Few were large enough to employ more than one man in doping, and even he would not spend all his time at the work. It was easy to see why, even with the dangerous tetrachlorethane dope, which was still in use in some plants and had been used in several more, no case of toxic jaundice had developed. The exposure had not been long enough or severe enough. Dopers are a shifting body of men. Of fifty-three men interviewed, more than half had worked less than three months.

All these features, however, were already changing. The new factories had doping rooms and were preparing for work on a large scale. It was evident that in the future many more dopers would be employed, and that they would work continuously and in an atmosphere full of dope fumes from the drying wings. The men in charge told me that they knew doping was attended with danger, but for the most part they did not know which were the dangerous compounds in the dope or which variety was the more dangerous. I felt convinced that with conditions as they were in some of the new factories, this winter would see several cases of dope poisoning if tetrachlorethane dopes were to be used; for instead of installing down-draft suction to remove the heavy fumes, several managers were trusting to window ventilation only.[7]

Though I did not find evidence of toxic jaundice among dopers, men who worked with tetrachlorethane dopes had felt the effects of the fumes somewhat. Drowsiness was oftenest complained of, most troublesome early in the morning, and passing off as the day wore on; worse after a holiday, as if the immunity acquired had been lost, and much worse in hot, heavy weather. Some men said they were even sleepier after leaving work than while in the fumes.

There were instances of men being actually overcome by the dope fumes, but these were under exceptional circumstances, such as very hot weather and an unusual rush of work; or the doping was carried on in a greenhouse with the sun beating on the glass roof; or the

5. Wilcox: Lancet, London, 1915, **1**, 544.
6. Koelsch: München. med. Wchnschr., 1915, **62**, 1567.

7. An investigation of aeroplane factories in New York State was undertaken by the State Industrial Commission and entrusted to Drs. Lester Roos and Rosalie Bell. They found one man using tetrachlorethane who showed a slight jaundice, but whose symptoms were chiefly nervous: dizziness, sleepiness, and attacks like alcoholic intoxication.

man had lain on his back to dope the under side of a wing and had breathed the fumes that fell directly in his face. Two dopers were rather seriously "knocked out" when a pail of dope was spilled over the clothing of one, and the other had gone to his assistance and tried to drag him outdoors. Both lost consciousness, and the one with the soaked clothing had an alarming respiratory failure requiring artificial respiration for some minutes. Neither had any lasting effect from the accident. Nausea and headache usually follow such an attack of faintness, but no symptoms of abdominal disturbance of any seriousness were reported to me. Constipation was complained of only occasionally. Two men spoke of an increased craving for food at the same time that they were losing weight.

At the time I made my inquiry, between April and September, 1917, two kinds of dope were in use, cellulose acetate and cellulose nitrate. The former is relatively noninflammable, and is used on war planes. Its best solvent is tetrachlorethane, to which is usually added some acetone, benzene and alcohol. Cellulose nitrate is inflammable and must be covered with a noninflammable varnish; but even with this it is not fit to be used on war planes, though it is all right for planes used in training. The majority of the factories at that time were making training planes and doping with nitrate dope. A few used acetate dope with tetrachlorethane. Now we are beginning to make war planes, and the dope advocated by our Signal Corps, the dope that will probably be generally adopted for war planes, is made of cellulose acetate dissolved in acetone, alcohol and benzene, or the acetone may be replaced by a mixture of methyl alcohol, methyl acetate and acetone. This means that the dangerous tetrachlorethane is gradually disappearing from our airplane works, and that the solvents encountered by dopers from now on will be benzene, methyl alcohol, acetone and other ketones, amyl acetate, and perhaps amyl alcohol. All these are volatile substances, capable of setting up industrial poisoning because they can be absorbed through the respiratory tract as well as by the intestinal tract; but their toxicity differs greatly in degree.

Benzene is much the most toxic, but there is not more than 12 or 15 per cent. of benzene in most dope, and from that amount one would look not for severe acute poisoning, but rather for the lighter forms, as dizziness, headache and transient excitement like drunkenness, followed by depression and nausea—the range of symptoms which rubber workers describe under the term "naphtha jag," and which dopers also describe fairly frequently. Probably chronic benzene poisoning may begin to appear now, for there will be much longer exposure to the effects of the vapors than heretofore.

There is a decided prejudice against amyl acetate among workmen, and many of them told me that it was much more poisonous than tetrachlorethane. Physicians sometimes believe this, and think that a change for the better is made when the foreman gives up the disagreeable "banana oil" and substitutes acetate dope with tetrachlorethane. Amyl acetate does cause smarting of the eyes, and sometimes conjunctivitis, and there may be an irritating cough; but so far we have little evidence of its danger as an industrial poison. Koelsch[8] went carefully into the question of amyl acetate poisoning among men using it in varnishes and lacquers, and was convinced of its slight harmfulness. He then experimented on himself, vaporizing it and breathing the fumes. He had an inclination to cough, a feeling of heat in the head, and a slightly rapid pulse. Later he became dizzy, drowsy annd confused and tired, with quick, deep respirations. He found it hard to climb the stairs after he had gone home.

Koelsch also tested amyl acetate on animals, and though the symptoms caused by it were transient, yet after a long exposure (237 and 340 days) the animals lost weight and died, with fatty liver, and edema of the lungs with areas of pneumonia. Lehmann's[9] animals also reacted to large doses of the vapors, but showed no permanent lesions. He did not, however, expose them as long as Koelsch did his.

It would seem, then, that workers exposed to amyl acetate may suffer from smarting eyes, dry throat, obstinate cough, dizziness, drowsiness and weariness, and it is possible that long continued exposure may produce changes in organs, especially in the liver.

According to our present knowledge, acetone is harmless; but very little work has been done, and the matter is far from settled. Amyl alcohol (fusel oil), according to Salant,[10] is seven times as toxic for frogs as ethyl alcohol, and four times as much so for rabbits. In human beings its effects are like those of ethyl alcohol; but it is more rapid, severer, and accompanied by a more decided fall of blood pressure.

Among these solvents for dope, there remains to be considered methyl alcohol. The toxicity of this compound is very much a matter of controversy. We know, from Reid Hunt's[11] experiments, that pure methyl alcohol produces all the characteristic symptoms of wood alcohol poisoning, and that they are not to be attributed to the impurities only; but we do not know what proportion of it is dangerous. Our denatured alcohol usually contains about 4 per cent., and it is assumed that this is well within the danger limits; but German denatured spirits contain only 2 per cent., and yet there has been so much complaint of sickness among workmen caused by denatured alcohol that, according to Goldschmidt,[12] petitions have been sent to both the Reichstag and the Bundesrath for an inquiry into its harmfulness. Apparently individual susceptibility to wood alcohol varies enormously. The serious action on the eye makes industrial poisoning from methyl alcohol specially to be dreaded.

SUMMARY

It seems that we need not dread the "toxic jaundice" that attracted so much attention in England and Germany, for we shall probably not use tetrachlorethane dope to any great extent. Our dopers will be exposed to the fumes of benzene, methyl alcohol and other alcohols, acetone (dimethyl ketone) and other ketones, and amyl acetate. Of these we know that the first two are industrial poisons of distinct danger; the others are less known and probably much less dangerous. We ought to insist, however, on abundant ventilation for doping rooms, as the English do, and it would be an excellent thing if we also followed this example in insisting on regular medical examination of dopers, for then we should be able to gather the much needed data concerning the less well known of these dope solvents.

Hull-House.

8. Koelsch: Concordia, 1912, **19**, 246.

9. Lehmann: Arch. f. Hyg., 1913, **78-79**, 260.
10. Salant: Proc. Soc. Exper. Biol. and Med., 1909-1910, **7**, 134.
11. Hunt, Reid: Bull. Johns Hopkins Hosp., 1902, **13**, 137.
12. Goldschmidt: Weyl's Handbuch der Hygiene, **8**.

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THE VITAMIN HYPOTHESIS IN RELATION TO ALLEGED DEFICIENCY DISEASES

The "vitamin" hypothesis of Funk postulated the existence of a number of unidentified dietary essentials, each of which acts as a protective substance to the organism. Accordingly, the lack of one or another of these was believed to lead to the development of a specific syndrome; in one case it was beriberi, in another scurvy, in another pellagra. Even rickets and less clearly defined failures of nutrition were brought into the range of possible explanation. In this sense the expression "deficiency disease" has become popular; and the lack of some necessary though undemonstrated food factor became a satisfying though vague explanation that is readily accepted by the uncritical.

There seems to be no doubt at present of the actual existence of deficiency diseases in the original sense in which this expression was used, that is, a syndrome due to the absence of a specific as yet unidentified food factor. For beriberi this seems to be demonstrated; and the xerophthalmia that has been observed repeatedly in children forced to live on unsuitable rations appears to belong in a comparable category. We recently referred to the severe cases of necrosis of the cornea in Danish children that had been fed with nearly fat-free separator milk.[1] They responded to breast milk feeding, to whole milk mixtures or to administration of cod liver oil. The latter has been shown by Osborne and Mendel to contain a fat-soluble food hormone or vitamin similar to the dietary factor found in the fat of milk, if not identical with it. Hence it is probable, as McCollum and Simmonds[2] have likewise recently concluded, that these cases of xerophthalmia reported in Japan and Denmark in times of famine and unsuitable rationing should be looked on as a "deficiency disease" not recognized in its true relation to diet. It is not, as most of the foreign authors believe, a "fat starvation" that produces the condition, but a lack of the unidentified dietary factor, fat-soluble A, which occurs in just those foodstuffs that they observed to possess curative properties.

McCollum and Simmonds have lately arrived at this general conclusion: There are two deficiency diseases in the sense in which Funk employed this term. One of these is polyneuritis, which Funk recognized. This is due to a lack of an adequate supply of the unidentified water-soluble B, which is abundant in all natural foodstuffs but is practically absent from purified starch, polished rice, sugars, and all fats of both animal and vegetable origin. The other they believe is the syndrome described above in which the most prominent features are emaciation and xerophthalmia. Scurvy, pellagra and rickets they believe can be accounted for by errors in the diet without assuming a protective substance for each of them.

There is evidence of a growing reaction against the acceptance of the vitamin deficiency hypothesis to account for all manner of disease syndromes. In the case of pellagra the theory of a possible infection factor continually reasserts itself.[3] But particularly in the case of scurvy has the vitamin hypothesis encountered setbacks in recent critical investigations. McCollum has opposed this explanation of the etiology of the experimental scorbutus in the guinea-pig, the classic laboratory subject for experimentation in this field. And recently Hess,[4] who has long and vigorously maintained that pasteurized milk brings about infantile scurvy in some cases unless an antiscorbutic food is included in the dietary,[5] has ventured the statement that this is not a simple dietary disease. This point of view is developed somewhat as follows: In infantile scurvy the diet is at fault, says Hess, in allowing the intestinal bacteria to elaborate toxins. It is doubtful whether the toxin is always the same, and therefore whether, from a strictly etiologic standpoint, this disorder should be regarded as an entity. Infantile scurvy is an intestinal intoxication or an autointoxication due to the overgrowth of harmful bacteria in the intestine. It is the product of an unbalanced flora that is no longer controlled by a proper dietary.

Oliguria is a common symptom of scurvy. The mild therapeutic effect of citric acid may be ascribed, according to Hess, partly to its diuretic properties. Orange juice also was found to bring about marked diuresis. One of the striking and important symptoms of scurvy, Hess adds, is a susceptibility to infection (furunculosis, nasal diphtheria, "grip," etc.). Some

1. Bloch, C. E.: Carbohydrate Starvation in Infants, Ugesk. f. Laeger, 1917, **79**, 279; abstr., THE JOURNAL A. M. A., May 12, 1917, p. 1444; Eye Diseases and Other Disturbances in Infants from Deficiency in Fat in the Food, Ugesk. f. Laeger, 1917, **79**, 349; abstr., May 19, 1917, p. 1516. Monrad, S.: Alimentary Gastro-Enteritis and Xerophthalmia in Infants, Ugesk. f. Laeger, 1917, **79**, 1177; abstr., Sept. 29, 1917, p. 1122. Rønne, H.: Carbohydrate Dyspepsia and Xerophthalmia, Ugesk. f. Laeger, 1917, **79**, 1488; abstr., Dec. 1, 1917, p. 1988.

2. McCollum, E. V., and Simmonds, N.: A Biological Analysis of Pellagra-Producing Diets, II, The Minimum Requirements of the Two Unidentified Dietary Factors for Maintenance as Contrasted with Growth, Jour. Biol. Chem., 1917, **32**, 181.

3. Siler, J. F.; Garrison, P. E., and MacNeal, W. J.: The Relation of Pellagra to Location of Domicile in Inman Mills, Inman, S. C., Arch. Int. Med., October, 1917, p. 521.

4. Hess, A. F.: Infantile Scurvy, V, A Study of Its Pathogenesis, Am. Jour. Dis. Child., November, 1917, p. 337.

5. Hess, A. F.: Subacute and Latent Infantile Scurvy, THE JOURNAL A. M. A., Jan. 27, 1917, p. 235.

hemorrhages are due to this secondary infection, and are to be regarded not as scorbutic, but rather as focal complications. Other hemorrhages are truly scorbutic. Scurvy, however, is essentially a disorder characterized by malnutrition and not by hemorrhage, taking months to develop and, from a clinical point of view, frequently latent or subacute.

Where is the much abused pasteurized milk left in this analysis? According to Hess, faulty diet is only one of several factors in the pathogenesis of infantile scurvy. Pasteurized milk, he states, was found to be a contributing cause if it was not fresh — if given from twenty-four to forty-eight hours after pasteurization. From this point of view, he argues, milk pasteurized in the city is preferable to milk pasteurized at the creamery, which reaches the consumer much longer after the heating process. Aging seems to play a greater part in the production of scurvy than heating, whether the milk was pasteurized or raised to the boiling point. It was found that even raw milk on aging loses its antiscorbutic properties.

One may well ask, in the light of what is now being written, whether scurvy is, after all, a distinct entity. Where vague dietary factors and equally indefinable bacterial perturbations in the alimentary tract vie with each other in the genesis of a syndrome, the open mind represents a safe attitude until more definite conclusions can be agreed on.

TRINITROTOLUENE (T. N. T.) POISONING AMONG MUNITION WORKERS

War is a grim teacher; and he must be unobservant, indeed, who fails to note the numerous facts of profound scientific importance which its concomitants and consequences have instilled into the mind. This is true in the domain of disease quite as well as in other fields in which science holds sway. For the physician, gaseous chlorin had only the remotest interest at the period when the war broke out. Today poisoning with the gases used like chlorin in warfare offers a serious problem to those entrusted with the management of "gassed" victims.

Not only the actual performances on the field of battle but also the diverse preparatory processes that make possible warfare of the ultramodern sort harbor hitherto unsuspected or underestimated menaces to human health. To take proper cognizance of them means not only to prolong life and alleviate suffering in hundreds of instances, but also to promote efficiency in preparation for the strife by suitable prophylactic or other sanitary measures. Munition workers have come to be a most important element in the struggle to win. Their health has been a source of solicitude in all of the countries concerned; and in the United States, where the difficulties to be encountered are somewhat more recent, we must try earnestly to profit by the experience of those who entered the conflict earlier. Today the possible necessity of protective measures against exposure to lead, tetrachlorethane, nitrous fumes, trinitrotoluene, tetryl (tetranitromethylanilin), fulminate of mercury and certain lubricating and cooling fluids (petroleum products) used with metal products has emerged into distinct prominence.

Early in the war we called attention[1] to the serious and novel danger attending the use of tetrachlorethane as an ingredient of the varnish used to cover the wings of aeroplanes. At least seventy cases of jaundice with several deaths were reported in Great Britain before a substitute for this solvent was introduced into use. The history of the experience with the solvents or "dopes" used in aircraft manufacture has been related by Dr. Alice Hamilton[2] in this issue of THE JOURNAL. A new device calling for new modes of production under great stress has suddenly brought to light novel industrial dangers. Far more conspicuous is the problem of poisoning with trinitrotoluene — the T. N. T. of the army and navy vocabulary — which has likewise attained an enormous importance in munitions manufacture.

One commentator has remarked that trinitrotoluene shows itself a splendid antagonist in the resourcefulness of its attack and the variety of symptoms produced. A cardinal symptom is toxic jaundice, which may appear quite suddenly in munition workers or may show such premonitory symptoms as drowsiness, dizziness, depression and dark urine. Dermatitis due to the local action of the explosive sometimes occurs. A toxic gastritis is a far more important symptom. This gastric catarrh makes up part of the so-called minor illness attributable to trinitrotoluene. A discussion of this important subject before the Sections of Medicine, Pathology and Epidemiology of the Royal Society of Medicine in London[3] brought out the fact that the other minor illnesses due to trinitrotoluene are probably thirty times more frequent than jaundice; and as many thousands of workers are employed in the handling of trinitrotoluene, the problems of its toxic effects are of the greatest importance in preventive medicine and the production of munitions for the successful prosecution of the war.

Since trinitrotoluene liberates fumes at a temperature as low as 32 C. (89.6 F.), it has been argued that the poison enters the body by inhalation of nitrous fumes, on the circumstantial evidence that the incidence of its toxic effects varies with the ventilation of the factories. When the circulation of air is defective, and fumes are given off by molten trinitrotoluene, the toxic effects become more frequent, whereas good ventila-

1. Tetrachlorethane, Current Comment, THE JOURNAL A. M. A., Oct. 30, 1915, p. 1561.
2. Hamilton, Alice: Industrial Poisoning in Aircraft Manufacture, THE JOURNAL A. M. A., this issue, p. 2037.
3. The Origin, Symptoms, Pathology, Treatment and Prophylaxis of Toxic Jaundice Observed in Munition Workers, Being a Discussion by the Sections of Medicine, Pathology and Epidemiology of the Royal Society of Medicine (January, 1917), London, Longmans, Green & Co.

tion is accompanied by freedom from illness. Moore's recent analytic and experimental investigations appear to prove that the skin is the main channel of absorption of trinitrotoluene, and he insists that inhalation of its fumes or of its dust does not play any part. There is some evidence that an oily condition of the hands, such as may result from handling silk bags saturated with petrolatum, favors absorption. Personal susceptibility has some influence in determining the incidence of symptoms, and whether they appear after a short or after a considerable period of work. This is well shown in the case of dermatitis. But the amount of the exposure, or in other words the dose of the poison, is the more important factor in producing the toxic effects.

Surgeon-General Rolleston[3] has pointed out that the pathologic lesion of the liver found associated with the toxic jaundice of munitions workers is the same as that long familiar as acute yellow atrophy. The process is one of degeneration and necrosis of the liver cells, associated with infiltration and subsequent fibrosis resembling ordinary portal cirrhosis. The incidence of the disease can be overcome not by one precaution alone, but by the combination of several, of which alternation of employment, frequent periodic medical examination, ventilation, and clean working are the chief. Rolleston has thus summarized the prophylaxis of trinitrotoluene poisoning, of which cases are already being reported in this country:[4] In the first place, the absorption of the poison should be prevented by minimizing the opportunities of contact between the skin and trinitrotoluene. Every care must be taken to avoid spilling of the powder on the tables, floors, and the outsides of the shells and bombs. The hands should be kept clean, and freed from adherent trinitrotoluene by a solvent, such as acetone. Similarly, the hair and the underclothing must be kept free from the powder. Periodic alternation of shifts, so as to reduce the exposure to the poison, and prompt removal when toxic symptoms threaten, are essential. Good ventilation, substantial meals, and exercise are important to maintain a good standard of health and to keep the bodily resistance high. The application of prophylactic measures of this order has already resulted most satisfactorily in the munition works of the British Admiralty, where thousands of employees are involved.

The manufacture of trinitrotoluene in this country is mainly confined to a few firms, so that effective supervision can be planned. The loading of shells, on the other hand, is likely to be carried on by any manufacturer possessing the requisite facilities, which are comparatively simple. In a paper on the safe handling of trinitrotoluene, read before the Section on Industrial Hygiene of the American Public Health Service, Surgeon Schereschewsky of the U. S. Public Health Service pointed out that the number of workers involved in loading operations is likely to be much greater than that concerned in the manufacture of this substance. Besides this, he added, long contact with the production of other poisonous nitrated benzene products should have given manufacturers of trinitrotoluene the requisite experience to enable them to handle the manufacture of this substance with safety to the workers concerned. In addition to this, in the manufacture of trinitrotoluene, except at the final sieving and packing operations, the substance is handled either in closed containers or in a moist condition, under which circumstances the risk of poisoning is greatly reduced. In loading operations, on the other hand, there is constant opportunity for nearly every one connected with such work to become the subject of chronic poisoning through either the fumes or the dust of this substance. Valuable practical points have been outlined by Schereschewsky[5] in a recent number of *Public Health Reports* which should be in the hands of every one interested.

4. Martland, H. S.: Trinitrotoluene Poisoning, THE JOURNAL A. M. A., March 17, 1917, p. 835. Hamilton, Alice: Industrial Poisons Encountered in the Manufacture of Explosives, ibid., May 19, 1917, p. 1445; Trinitrotoluene Poisoning, Med. and Surg., 1917, **1**, 761.

5. Schereschewsky, J. W.: Trinitrotoluol: Practical Points in Its Safe Handling, Pub. Health Rep., 1917, **32**, 1919.

6. Starling, E. H.: Human Physiology, 1915, p. 834.

CONDITIONS AFFECTING THE FORMATION OF RED BLOOD CORPUSCLES

The normal response of the organism to a loss of red blood corpuscles, such as occurs through hemorrhage, consists in an increased activity of the blood-forming cells of the red bone marrow. New erythrocytes are formed to replace those of which the circulation has been deprived. This corrective mechanism, if it may so be termed, is the wholesome device whereby a harmful diminution in oxygen-carrying capacity of blood is prevented and the necessary factors for proper tissue respiration are restored. Heretofore it has not always been easy to follow the course of a regeneration of red corpuscles or to investigate the process at the seat of their formation, for, as Starling[6] has expressed it, in the confused medley of colorless cells which exist in the bone marrow and are precursors of all the varied corpuscles found in the blood, it is difficult to be certain of the identity of the colorless erythroblasts and to distinguish them from the smaller colorless cells engaged in the bone formation or in the production of leukocytes.

More recently a helpful new method of following the hematopoietic activities of the bone marrow has been devised by the study of the so-called reticulated corpuscles in the blood. When fresh, unfixed blood is treated with solutions of various dyes, such as brilliant cresyl blue, polychrome methylene blue or neutral red, a remarkable otherwise invisible structure is detectable. In suitable prepared specimens a granulo-

filamentous or reticulofilamentous substance appears in the form of coarse granular particles which are sometimes discrete, but more often occur in threads which are woven into skeins or wreaths of great complexity and fill a considerable portion of the cells. According to Vogel and McCurdy,[7] in the blood of infants these reticulations are found in from 5 to 10 per cent. of the erythrocytes, and in normal adult blood in from 0.5 to 2 per cent. In severe anemias, however, their number is much increased, running as high as 18 or 20 per cent.; while in hemolytic jaundice, which is the condition par excellence for their prevalence, they may occur in still greater proportions. Vogel and McCurdy believe that the filamentous substance is not a preformed structure, but is a precipitation product of the stain. They regard it as an evidence of youth in the cells and not of degeneration. Vogel and McCurdy thus present the significance of the reticulated cells: In conditions in which a severe drain on the erythrocytes is being sustained by a well functionating bone marrow, large numbers of reticulated cells are found; whereas in aplastic cases they may be diminished almost to the point of absence; that is, in a manner somewhat comparable to the behavior of the erythroblasts, the reticulated cells afford a direct insight into the hematopoietic activities of the bone marrow. For clinical purposes they form a more convenient measure of this function than do the nucleated cells, as their percentage relations to the erythrocytes can be more easily and accurately determined, and their enumeration is to be urged as a part of the study of the blood in all cases of severe anemia.

By enumeration of the reticulated cells as well as by various older modes of investigation, the stimulating effect of loss of blood on the regeneration of blood cells has been put beyond question. Indeed, it appears that the bone marrow functions constantly in supplying new red corpuscles to replace those lost daily in the process of normal blood destruction. How shall we picture the functioning of the active marrow under conditions in which a need of erythrocytes is not imperative, that is, when there is a plethora of them? This is precisely the situation after the transfusion of blood.

Experiments have recently been conducted in the laboratories of the Rockefeller Institute for Medical Research by Robertson[8] to determine whether a diminished activity of the bone marrow can be brought about in animals by plethora produced by repeated small transfusions of blood. Counts of the number of reticulated red cells in the circulating blood were made during the course of the experiments as an index to changes in the activity of the bone marrow. With the development of plethora, the number of reticulated cells in the blood decreased. In the majority of the plethoric animals, this diminution was extreme, and in some instances, reticulated cells practically disappeared from the blood. A comparison of the red bone marrow of these animals with that of normal controls revealed a marked reduction in the content of reticulated cells. After a number of transfusions, there occurred in some of the plethoric rabbits a sudden and marked drop in hemoglobin. The hemoglobin continued to fall until a severe grade of anemia was reached. This was followed by a striking rise in color index. During regeneration the reticulated cells were enormously increased in number.

As Robertson notes, these facts taken together show that the bone marrow is markedly influenced by plethora. There is a very practical application of the findings to the management of certain cases in which transfusion is currently employed. It has been stated that greater judgment is needed in determining the amount of blood to be transfused. Thus Vogel and McCurdy believe it quite possible that too large an amount of transferred blood may be injurious in pernicious anemia, in which transfusion is a valuable form of palliative treatment. The experience of Robertson may account for the diminished bone marrow activity which sometimes occurs after transfusion. In such cases, he explains, there is a marked drop in the number of reticulated cells and other evidence of bone marrow depression; the patient shows no benefit from transfusion, or may grow rapidly worse. The cause of this depression is best explained on the basis that in severe instances of the disease, when exhaustion of the bone marrow is imminent, the stimulus of the anemia is only just sufficient to keep the marrow functioning. A sudden lowering of this stimulus is brought about by the introduction of a large quantity of blood into the circulation, and the result is a fall in the activity of the bone marrow. It follows from this that in pernicious anemia with a feebly reacting bone marrow as indicated by the number of reticulated red cells, small transfusions are preferable to large ones.

7. Vogel, A. M., and McCurdy, V. F.: Blood Transfusion and Regeneration in Pernicious Anemia, Arch. Int. Med., December, 1913, p. 707.
8. Robertson, O. H.: The Effects of Experimental Plethora on Blood Production, Jour. Exper. Med., 1917, **26**, 221.

Sanitary Waste Disposal Systems for Unsewered Towns and Villages.—Public Health Bulletin 89 of the Public Health Service concerns a sanitary privy system for unsewered towns and villages, and gives details for the construction of sanitary privies which may be applied to existing buildings. A number of towns in various states, particularly in the South, not having sewerage systems, have adopted the sanitary privy system as described in the bulletin. Among them is Tuscaloosa, Ala., which passed an ordinance providing for the installation of this system and regulations for effectively carrying out this method of waste disposal. The ordinance in Tuscaloosa was backed by strong public sentiment and was rigidly enforced. Prior to the installation, there were 1,158 open, insanitary privies. As an indication of the effect of this sanitary measure, it is shown that typhoid fever was reduced from 190 cases and 17 deaths in 1915, the year before the sanitary work was done, to 14 cases with 1 death for 1916. Of the cases occurring in 1916, six gave histories showing that the infection was contracted outside of the city.

Current Comment

THE SOURCE OF ENERGY IN THE BEATING HEART

It is now generally accepted that although muscular work can probably be performed at the expense of any of the foodstuffs or the three proximate classes of constituents of the body, carbohydrate is the immediate or most readily available source of muscular energy. The respiratory quotient, or ratio CO_2/O_2, would be equal to unity if the entire requirement for energy were satisfied by the oxidation of carbohydrate; that is, the output of carbon dioxid formed would be exactly equal in volume to the oxygen required. As a matter of fact, Benedict and Cathcart[1] found in their extensive studies of muscular work that there is almost always a rise in the respiratory quotient during work. After the cessation of the exercise, the respiratory quotient sinks again. During a "century run" on a bicycle, the respiratory quotient remained at about 0.9 throughout the experiment, indicating that the body's glycogen was being used in goodly measure. An interesting confirmation, so to speak, has been furnished in a quite different manner by Snyder,[2] who has accurately measured the average amount of heat liberated per beat and gram of tissue by the ventricle of surviving hearts. He has calculated the quantity of glucose required to yield the measured calories, and finds it to be essentially equivalent to the amount demanded by the corresponding carbon dioxid production of the beating heart as well as to the amount found by Clark[3] to disappear in contracting hearts. Therefore, Snyder argues, glucose or some carbohydrate of equal heat of combustion is the presumable source of the heat liberated by the beating heart.

PHYSICAL RECONSTRUCTION

In this country prior to the war there were thousands of physically handicapped men who through lack of training were unable to make a living. Unfortunately we have been as prodigal of human brain and brawn as of money and material, and in the years past we have made no systematic attempt at human salvage. The terrible ravages of this war in men and materials acutely emphasize the importance of the work of physical reconstruction and reeducation in its relation to world economy. The time has arrived when conservation has become acutely necessary, conservation not only of material but also of men, and not only of men but also of human energy. The time has passed when we can afford to discard as derelicts those whose capacities do not measure up to our standard of efficiency. Our allies unfortunately "had no precedents to guide" in the care of their injured soldiers. The lessons learned from the experience of all the warring nations are available. Though meager, as compared with the complexity of the problem, these lessons point with precision to one necessity—military control. From every hand comes the advice to hold the soldier until he is prepared to return to work in civil life. Division of duties and authority has in the countries of our allies resulted in discontent and unsatisfactory conditions. This we can avoid because there is yet time for us to evolve a system that will place the responsibility of action where it rightly belongs. Reconstruction is both physical and mental. A large and important phase belongs in the domain of surgery; however, readjustment is not always accomplished by an operation; it is found equally as important that vocational training should be carried on in the hospitals, not only on account of its educational but also because of its therapeutic value. Occupation speeds recovery, idleness retards it. The problem, after all, is to determine the best means to give the man an opportunity, in spite of his disability, to earn a livelihood. The decision of this question should rest with the department of the government charged with the responsibility of the physical care of the soldiers, the department which opens the gate for his entrance into the Army, follows him down that dangerous path of duty, works to restore him when incapacitated, and studies under the most intimate associations his physical and mental abilities—the Medical Department of the Army.

MUSCULAR WORK AND THE BLOOD

At a time when millions of persons are applying their energies to a degree that the world has probably never known before, it is important to understand thoroughly the physiology of muscular exercise. It has long been known that changes occur in the blood as the result of exercise. Muscular work, whether moderate or severe, produces a rise of blood pressure and an acceleration of the pulse. There are alterations also in the composition of the blood. The number of red corpuscles is noticeably increased; and this result appears on first consideration as a most beneficent phenomenon whereby a greater oxygen-carrying capacity is imparted to the circulating fluid at a time when the demand for oxygen in tissue respiration is decidedly augmented. The explanation of this enrichment of the blood in red corpuscles as an incident of muscular exercise has not been uniform. Some authors[1] have explained their results on the basis that there are masses of corpuscles stored away in certain organs that may be liberated in time of need, while Lamson[2] believes that the number of corpuscles is altered by a splitting of old corpuscles or a production of new ones, as well as by storage in the liver. More recently, Scott[3] of the University of Minnesota has come to the conclusion that the capillaries of special organs do not thus contain large numbers of corpuscles that may be liberated at any moment and pass into the general

1. Benedict, F. G., and Cathcart, E. P.: Muscular Work, Publications of the Carnegie Institution of Washington, 1914, No. 187.
2. Snyder, C. D.: On the Heat Liberated by the Beating Heart, Am. Jour. Physiol., 1917, **44**, 421.
3. Clark, A. H.: Jour. Exper. Med., 1916, **24**, 621.

1. Hawk, P. B.: Am. Jour. Physiol., 1904, **10**, 384. Schneider and Havens: Am. Jour. Physiol., 1915, **36**, 239, 380.
2. Lamson: Jour. Pharmacol. and Exper. Therap., 1915, **7**, 169; 1916, **9**, 129.
3. Scott, F. H.: Factors Influencing the Interchange of Fluid Between Blood and Tissue Spaces, I, Blood Pressure, Am. Jour. Physiol., 1917, **44**, 298; II, Muscular Activity, ibid., 1917, **44**, 313.

circulation. He has compared the capillary blood of various organs with that in the larger blood vessels, and has always found them practically identical in hemoglobin content. Consequently, Scott argues, one may consider any alteration in the hemoglobin value or corpuscle mass found within a few minutes as due to the passage of fluid out of the blood to the tissues, or vice versa. Scott has demonstrated that the hemoglobin content of the blood is rapidly modified by any alteration in blood pressure, a rise of pressure leading to an increase of hemoglobin, and a fall to a decrease. These results can be explained only by the forcing of fluid by the increased pressure out of the blood tissue spaces, and the passage of fluid back from the tissue spaces to the blood when the pressure is lowered. In view of the fact that a rise in blood pressure invariably attends muscular work, the increment in corpuscles can thus be explained. Furthermore, there is an increase in the water content of muscle as a result of contraction, if the blood is circulating through it. Thus a passage of fluid from blood to muscles comes about, whereby the alterations in blood composition are further facilitated.

EXPERIMENTAL SCURVY—A HISTORICAL NOTE

The credit for demonstrating and describing the production, in animals, of a condition resembling scurvy in man is usually ascribed to Professor Holst and his co-workers in Christiania, Norway. In 1912, he published a report of his now classic experiments on the symptoms and pathologic lesions produced in guinea-pigs by means of a diet of cereal grains.[1] His observations have frequently been repeated, notably by Baumann and Howard, H. B. Lewis, Jackson and others in this country.[2] Hess[3] has recently pointed out the little known fact that comparable findings of typical symptoms in guinea-pigs were reported much earlier by one of America's foremost comparative pathologists. In a bulletin on "Bacilli in Swine Disease," published by the Bureau of Animal Industry, 1895-1896, Theobald Smith says (p. 172): "When guinea-pigs are fed with cereals (it has been observed for some years in this laboratory), with bran and oats mixed, without any grass, clover or succulent vegetables, such as cabbage, a peculiar disease, chiefly recognizable by subcutaneous extravasation of blood, carries them off in from four to eight weeks." Thus another instance of keen scientific observation is added to the record of the discoverer of the transmission of infectious disease through the intermediation of insects, and the original observer of the fundamental phenomena of what is now termed anaphylaxis.

1. Holst, H., and Froelich, D.: Ztschr. f. Hyg. u. Infektionskrankh., 1912, **72**.
2. Baumann, Louis, and Howard, C. P.: Am. Jour. Med. Sc., 1917, **153**, 650. Jackson, Leila, and Moore, J. J.: Jour. Infect. Dis., 1916, **19**, 478. Jackson, Leila, and Moody, A. M.: Ibid., 1916, **19**, 511.
3. Hess, A. F.: Infantile Scurvy, V, A Study of Its Pathogenesis, Am. Jour. Dis. Child, November, 1917, p. 337.

Progress.—Progress is not an accident, not a thing within human control, but a beneficent necessity.—Herbert Spencer.

Medical Mobilization and the War

PHYSICIANS AND THE SELECTIVE SERVICE

THE JOURNAL has been flooded with inquiries as to whether a physician may apply for a commission in the Medical Reserve Corps after December 15. The questions arose from the general announcements in newspapers that, according to the Selective Service Regulations, no registrant might enlist voluntarily after that date. Section 151 of the new Regulations states:

"(c) Any registrant at any time, regardless of classification and order number, may be commissioned in the Army, Navy, or Marine Corps, or appointed an army field clerk, and thereafter, on presentation by the registrant to his Local Board of a certificate of his Commanding Officer stating that he has been so commissioned or appointed, such certificate shall be filed with the Questionnaire and the registrant shall be placed in Class V on the ground that he is in the military or naval service of the United States."

The effect of placing in Class V is to exempt from the draft. It is, of course, obvious that a physician who has received a commission in the Medical Reserve Corps is subject to the orders of the Surgeon-General and must accept active duty whenever he is ordered into service.

It is desirable from the standpoint of those physicians who are registered that they act promptly. If a physician is ordered into service by his draft board before receiving his commission, he must go to the cantonment with his quota and will be held there as a private until the commission and orders to active duty are received. In connection with the first call, many physicians were in this condition, and numerous letters have been received from physicians who were serving at privates' wages in the cantonments, awaiting action on applications for commissions made through the division commander of the Medical Department after the physicians arrived in camp. The same delay is likely to occur in the future, so it behooves those who desire commissions to act promptly. Application blanks and general information will be sent by THE JOURNAL on request, accompanied by a self-addressed stamped envelope.

DEPENDENCY

A great many physicians have written to THE JOURNAL asking whether the rules governing dependency would apply to physicians as well as to others registered under the Selective Service. According to the Selective Service Regulations, "it is not the intent of the law to deprive the dependents, whom the law and regulations are designed to protect, of a reasonably adequate support. No definite degree can be given to the meaning of the term 'reasonably adequate support' as used in the classification rules and schedule. The adjustment of these rules must be left to local boards." The local board must, of course, consider the physician in the same light as any other registered man. It cannot consider him as a commissioned officer until his application has been accepted and the commission has been issued to him.

AMERICAN RED CROSS IN FRANCE

The work of setting in motion the activities of the American Red Cross in France is described by Paul U. Kellogg in the *Survey*, Nov. 24, 1917. Paris is the center of the work, at which place the commissioner and a number of deputies arrived, June 12, 1917. This is a working organization to project among a friendly people the instruments through which the funds raised in the United States could be brought to bear wherever and in whatever ways they would count for the most. In January, 1918, or six months from the beginning, it is expected that about 1,000 persons will comprise the executive force. There is to be a string of warehouses along the front extending from Dunkirk to Dijon, with reserve warehouses back of them and in the devastated areas, floating warehouses in Belgium, ready for any advance in the lowlands, great storage centers in Paris, receiving houses at all ports of entry, and purchase and supply stations in Great Britain, Switzerland, France, Spain and Portugal, as well as in America. The distribution of hospital supplies has been coordinated in a single agency, reaching 3,617 hospitals in 1,356 towns. Plants for the manufacture of special medical supplies, bureaus for the exchange of surgical methods, and reserves to stand back of the medical department of the American Army are being built up by the military affairs department, which is also establishing a canteen system that eventually will reach 1,500,000 French soldiers every month.

The duties of the American Red Cross in France are set forth as follows: First, to serve the Army of the United States; second, to serve the sick and wounded of the allied armies, and third, to give such general assistance as it can to the French people.

FROM AN M. R. C. IN FRANCE

The following letter is from a major in the Medical Reserve Corps, U. S. Army, who has charge of one of the base hospitals in France. The letter was personal and not for publication, but some parts of it are so interesting that they are reproduced.

We are still in the same location "Somewhere in France," and continue to carry on in this large hospital with its continuously increasing amount of work. It is very gratifying to be able to report that our relationship with the good British medical officers and authorities continues to be most cordial, with surprisingly little friction.

We have now been here long enough to take stock of the attitude of the medical officers coming from civil life and of their adaptability to do military surgery. The very loyal support that the medical officers of this organization have given to us throughout our association has been extremely pleasing. One notices a striking contrast to the friction that sometimes one observes in organizations of a like character in civil life.

All of the officers are accepting the necessary military control and discipline, and are coordinating in an intelligent and most satisfactory manner. They all seem to be able to forget their individual desires and conveniences, and to make their own opinions subservient to the direction of the people in higher authority.

Judging from our experiences, I believe it can be said without fear of contradiction that the men in the Medical Reserve Corps are rendering a splendid service and showing a disposition to work in perfect harmony with the Army Medical Corps. Obviously, it is necessary to have the most perfect accord and cooperation, in order to secure the most adequate organization to carry on the medical and surgical work in this great conflict.

I feel that the attitude and adaptability of the Reserve Corps officers will make the correlation relatively simple. Each and every one of the men in this organization has learned the necessity of military rules and regulations very rapidly, and I am sure that our good commanding officer, Col. C. C. Collins, has nothing of which to complain in this direction. Possibly some of this is due to his thoughtful consideration and diplomatic method of dealing with the situation. Throughout the whole organization there seems to be a realizing sense that we have a hard job to do and that it must be done with cheerfulness and cooperation.

Naturally, it is every good American's desire to go behind his own lines when the occasion arises for this necessity. At present it would appear that this eventually will probably occur.

I wish it were permissible to tell you how many patients we have treated at this hospital during the month of October. I can assure you that the number was exceedingly large. The medical personnel of this organization is having an opportunity for a wide and unusual experience in war surgery, and is responding to it in a most satisfactory manner, showing better surgical judgment each day.

We have now been here nearly six months, and I think our experience justifies us in stating that there is very little in war surgery that is not covered by the general surgical principles as laid down in civil life. One of course has to deal with pathologic conditions a little more complicated, because of the more serious and virulent types of infection with which we are brought in contact. There is a certain psychology in war time, I think, which makes all men somewhat more radical; and this applies to the medical department as well as to other branches of the service. In this connection I find it is necessary to exercise a little control and restraining influence in the direction of conservatism regarding the saving of limbs and the preservation of tissues that are sometimes sacrificed by the too extensive excision of infected areas.

I think we are all agreed that the time that elapses between the infliction of the wound and the first adequate surgical treatment is an all-important factor. I should like to lay emphatic stress on this essential element of time in the treatment of the wounded, believing that in the organization of the surgical and medical work for the American Army this should be one of the fundamental considerations; and to this end, men familiar with large transportation problems should be consulted in developing a system for rapidly conveying the wounded to a place where adequate surgical treatment can be instituted.

I am very much impressed with the French so-called "perpendicular" plan of organization. This means that the wounded man is under the direction of the same organization from the time he is wounded until he reaches the ultimate base in the center of the country. This permits a single and unified method of treatment throughout his illness and convalescence.

I am convinced that any method which does not allow for a cooperative control of the patient as he passes from one hospital to another will not give the best results.

THE JOURNALS continue to come through more promptly than any other mail we receive. The reason for this, I do not know.

NEWS OF THE CANTONMENTS

Thirty-First Division, Camp Wheeler, Macon, Ga.

MEASLES AND PNEUMONIA

The measles epidemic is practically over, less than 100 of these patients now being in the hospital. The number of new cases of pneumonia grows somewhat less, but is still uncomfortably high. The mortality rate has also increased to about 18 per cent. It is believed that many more Type I and II cases are being found than formerly. The precautions against pneumonia in the camp are now about the same as against any other infectious disease. They include compulsory airing and sunning of tents; use of spit boxes with sand wet with cresol; washing of all tent floors with cresol solution daily; prohibiting spitting except in spit boxes, and isolation of all convalescent patients. Heavy clothing and three blankets have been supplied in all cases. Major Zinsser is making a careful epidemiologic study of the disease. While the partial grouping of cases points to infection, there can be no doubt that poor physique and low vitality are important predisposing factors.

ONE HUNDRED AND SIXTH SANITARY TRAIN

It is believed that the One Hundred and Sixth Sanitary Train is more nearly ready to take the field than any other organization in the division.

Captain Cupper of the British infantry, detailed as instructor in bombing in the division, gave a most interesting talk to the officers of the Medical Corps at their meeting last Monday afternoon. The captain has promised to lecture to the noncommissioned officers of the train at an early date, giving them the value of his long experience at the front.

New sanitary measures have been instituted tending toward the stamping out of the pneumonia epidemic. Not more than five men are allowed in each tent. Tents are mopped out with cresol solution each morning. Two sputum boxes to each tent and sputum boxes in each company street containing cresol solution are required. Guards are maintained at all times to see that tent doors are open and that these sanitary measures are enforced.

The ill from the sanitary train are handled similarly to the ill of a regimental infirmary. Each field hospital handles the dispensary one month at a time. Field Hospital No. 121 was relieved by Field Hospital No. 122, December 1, and will care for the ill for a period of one month.

We still have hopes of enjoying some day a hot bath, when the intricate heating system is finally installed.

BASE HOSPITAL NOTES

The roentgen-ray department is having a series of unusually interesting cases.

Frames for field hospital tents have been made and installed, and board walks from the corridors and tents are being made.

Major Hans Zinsser of the Surgeon-General's Office is here doing special epidemologic work with reference to pneumonia and meningitis. He is charting the camp and studying the situation from the standpoint of contact infection. He instituted a campaign against the careless disposal of sputum. Only five men are allowed to occupy each tent among the enlisted men, by direction of the Surgeon-General.

Lectures are delivered each night to the staff by one of the chiefs of service. These are proving both interesting and instructive. There is in process of evolution a recreation room for the use of the enlisted men.

Thirty-Fifth Division, Camp Doniphan, Fort Sill, Okla.

DISEASE INCIDENCE

Rain and colder weather materially increased the number of cases showing involvement of the respiratory tract, and "colds" are common. For the week ending November 30, the number of cases of pneumonia had increased to forty-nine. Quite a number of these cases are developing as a complication to measles, of which there are at present eighty-three cases in camp. There were five deaths during the week, four following pneumonia and one due to tuberculous meningitis. The necropsy in the cases of pneumonia following measles has quite uniformly shown the streptococcus. In all of these cases a marked fibropurulent pericarditis with effusion was found. Thus far, no new cases of cerebrospinal meningitis have developed, and the camp has only two of these cases to record at present. Prompt isolation of all contacts, and energetic treatment of these contacts with dichloramin-T in an oily medium, as furnished by the office of the Surgeon-General, appear to control the situation satisfactorily. The use of a plain oil spray seems to give equally good results, and has the advantage that it can be more easily applied, since it is less viscid than the oil to which dichloramin-T has been added. The oil spray is used every two hours in a de Vilbiss atomizer.

The transfer of patients into the new base hospital is now well under way. Practically all of the medical patients have already been transferred.

As soon as the operating rooms and the rooms for the specialists and the laboratories have been completed, the transfer of all patients from the post hospital, where they have until now been accommodated, will be made. It is expected that this will be effected during the ensuing week.

PERSONAL

Lieut. John A. Walker, M. R. C., of the base hospital, has been ordered to Oklahoma City, where he will be given a special course in orthopedic surgery.

Eightieth Division, Camp Lee, Petersburg, Va.

THE SANITARY TRAIN

Work in the sanitary train is progressing satisfactorily. The field hospital section is under the direction of Capt. Elliott B. Edie, M. R. C., and the ambulance section under the direction of Capt. Burr Ferguson, M. R. C. The regular course of instruction for medical officers and enlisted men is being carried on daily. The first hike was made, December 4, when the entire train marched to beyond Prince George Court House, where dinner was cooked on field ranges. Lieutenant-Colonel Rhoads, the division surgeon, visited the officers and men while at dinner and expressed himself as satisfied with the first practice march. There were several officers and men with sore feet, and Colonel Rhodes spoke to the officers and men on the care of the feet while on the march.

The sanitary train has an excellent football team, and has played a number of games with other organization teams at Camp Lee, and one outside game. Lieut. Joseph M. Barsky, M. R. C., Three Hundred and Twentieth Ambulance Company, and Lieut. James W. McPheeters, M. R. C., Three Hundred and Eighteenth Ambulance Company, play.

The Richmond Red Cross recently presented twelve standard ambulances and three motor trucks to the Three Hundred and Nineteenth Ambulance Company, and other equipment valued at $40,000. This company was organized in Richmond, and is under the command of Capt. Charles Howard Lewis, M. R. C., of that city.

December 4, Lieut. O. W. Budd of the Three Hundred and Twentieth Infantry gave an illustrated talk to the officers of the sanitary train on ambulance work in France. Lieutenant Budd has served with the American Ambulance in France and gave the officers a number of practical pointers. Lieutenant Budd told the officers that it was necessary for the ambulances to have wooden sides instead of canvas, and that ambulances in France have been modified to allow stretchers to be easily pushed in instead of requiring the use of a hook to hold the upper tier of stretchers. The lecture was most practical, and was appreciated by all the medical officers.

THE WORK OF SPECIAL NEUROPSYCHIATRIC BOARDS

The neuropsychiatric board under the direction of Major James R. Moore, M. R. C., had 179 cases referred to it during the months of September, October and November. Among these were found 45 cases of nervous disease, 10 psychoneuroses, 22 cases of alcoholism, 6 drug addicts and 33 mentally deficient. Eighty-four men were discharged on account of disability.

TUBERCULOSIS

The tuberculosis board, under the direction of Capt. George D. Hamlen, M. R. C., has begun a complete examination of the entire command. The men of the Three Hundred and Fifth Engineers have all been examined, and the number of active tuberculosis cases found approximates 1 per cent. Prior to the work of the board, 108 white and forty-seven colored men were rejected for active tuberculosis.

ORTHOPEDIC WORK

Capt. James T. Rugh, M. R. C., reported, December 4, to instruct regimental surgeons on the care of the feet and the prevention of orthopedic defects. At the regular weekly clinical meeting held at the base hospital, December 6, Captain Rugh gave a most instructive lecture on the anatomy and mechanism of the foot and the treatment of minor defects. The lecture was much appreciated by all the medical officers present.

GENERAL HEALTH CONDITIONS

During the past five week there have been 338 cases of measles and 421 cases of mumps, the majority of the cases being confined to one regiment. As a result of these diseases, the noneffective rate during this period has gradually increased from 1.2 per cent. to 3.8 per cent. Except among the colored troops, the venereal disease rate has been low; but over 90 per cent. of all the cases occurred prior to enlistment.

PERSONAL

Lieut. William J. Robbins, M. R. C., was thrown by a bucking bronco, November 25, and sustained a fracture of the neck of the femur.

Lieut. Romanus A. LaGrinder, S. C., N. A., medical supply officer, has been promoted to captain and ordered to Newport News, Va. His place has been taken by Capt. Rush Cameron, S. C., N. A.

Capt. E. J. Tucker, S. C., N. A., has been at camp for two weeks to study the water supply and sewage disposal system.

Capt. Lauren Thomas, M. R. C., has been ordered to his home.

Major Linsly R. Williams, M. R. C., delivered the Harvey Lecture at the Academy of Medicine in New York, November 24. The subject of the lecture was "Medical Problems of the War."

Lieut. Benjamin C. Cliff, M. R. C., was married, December 2, at Richmond to Miss Earline Eugenia Hart.

Major Henry P. Carter, M. C., U. S. Army, divisional sanitary inspector, has been transferred to Camp Logan, Texas. Major Carter left Camp Lee, December 4, and will be much missed by the medical officers of the division.

Eighty-Fourth Division, Camp Zachary Taylor, Louisville, Ky.

Louisville has felt wintry blasts since the night of the 6th, when 17 inches of snow fell, burying the camp in a white blanket. Most of the building roofs have not been equal to the strain and but few have escaped leaks which have been very inconveniencing to say the least. The barracks have been kept warm by the large drum stoves by which they are heated, but the patients in the base hospital have in many wards suffered keenly from the cold. For some reason the steam pipes leading to the various units, not connected by corridors, are carried on stilts 8 or 10 feet in the air, and with no return line for water of condensation and zero weather, those buildings farthest away from the power plant, several city blocks, are practically without any heat.

Snow has drifted through cracks around the ventilators in barracks and canteens, and caused considerable damage when it melted. A stock of cigarettes in the canteen of the Three Hundred and Thirty-Fourth Infantry, worth several hundred dollars, was ruined.

Railroads and city cars refused to accept shipments of milk for the camp on account of the snow blockades, and Lieutenant Shaw, adjutant at the base hospital, had to requisition four Quartermaster Department four-mule teams to haul 40 gallons of milk from the city to the patients.

The failure of the city railway to clear away the snow from the tracks leading to the camp and necessary discontinuance of car service caused great inconvenience of the thousands of soldiers on leave during the afternoons of last

Saturday and Sunday. Jitney busses charged $1 and $2 for the trip from Louisville to the camp.

Four hundred picked men from various organizations have been transferred to the Aviation Camp at San Antonio, Texas.

Dr. Clarence H. Ketterer of Butler, Pa., has been detailed to Camp Zachary Taylor as a junior member of the physical examining board and medical member of the board, Aviation Section of the Signal Corps, and has reported to division surgeon Col. John H. Allen. From this detail it is believed that applicants for the officers' training school for aviators are to be examined here. Authority has been received to accept 200 applicants possessing certain qualifications as students in the Aviation Corps. Applicants for this service are more rigidly examined than for any other branch. A revolving chair has already been received and is placed in the head surgery section of the base hospital.

War Department orders have been issued prohibiting the publication of rosters of officers or men during the period of the present emergency.

Six hundred and sixty-two soldiers have been discharged by the special tuberculosis board, of which Captain Lichty of Cleveland is president. A little over half of the division has been examined by the board.

NEW SANITARY REGULATIONS

Major Poust, the division sanitary officer, as the result of recent inspections of the camp, has issued a new form of instructions to improve sanitary conditions at the cantonment. The bakers are required to manicure their nails carefully each day, and before they go on duty there will be an inspection of hands by commissioned officers.

In regard to sleeping arrangements in the barracks, the beds are to be stationed so that every other man will sleep with his feet opposite the head of the man alongside. This will allow a space of 5 feet between heads and greatly reduce the chances of the spread of respiratory diseases. A certain number of windows in every barrack are to be kept open during the night, and a commissioned officer will be required to make inspections of the barracks twice each night to see that the order is being enforced.

SCHOOL FOR HYGIENE AND SANITATION

The school for hygiene and sanitation has been established, the course begining December 3. A medical officer has been appointed commandant of the school. Unlike most of the divisional schools, only commissioned officers will be required to take the course. The instruction will consist of sanitation in garrison, camp, on the march and in campaign.

BASE HOSPITAL ACTIVITIES

There are 730 patients in the base hospital, between 450 and 500 being purely medical. New wards have been established, one for hookworm patients and one each for active and suspected tuberculosis patients. Specimens from each patient in the hospital have been examined for hookworm, and eighteen positive cases have been found. These men will be vigorously treated and reexamined before being discharged.

With the arrival of the last 35 per cent. of the draft, 42,000 men will be in the camp. The quarters are adequate to receive them, and there are plenty of clothes and food.

ILLNESS IN MEDICAL STAFF

One officer and one nurse were admitted to the hospital, December 2, with measles.

Eighty-Ninth Division, Camp Funston, Fort Riley, Kan.

Everything is running smoothly in the Eighty-Ninth Division. Transfers from one branch of the service to another have about been completed. This week the colored regiment of the division was taken over by the Ninety-Second Division. The total number of whites rejected to date is 615, colored 51, grand total 666. There are at present thirty-seven rejections pending final action. One hundred and thirty-seven of these rejections were for pulmonary tuberculosis. This list is not the list of the medical examiners alone, for many men have appeared for examination on their own behalf. Not long ago a general order was issued, granting each man the right of reexamination if he believed his case had not been given proper attention.

The detention camp, capacity 2,500 men, built half way between this camp and Fort Riley, is now in full operation. The need of such a camp in as large a command as this is apparent, when one learns that it cuts down the noneffective number by one third.

DISEASE CONDITIONS AMONG TROOPS IN THE UNITED STATES

Extracts from Telegraphic Reports Received in the Office of the Surgeon-General for the Week Ending Nov. 30, 1917

1. Total strength of troops in United States as reported.....1,051,424
   Annual admission rate per 1000 (disease only)..... 1,423.6
   Non-effective rate (all divisions) 37.4
2. National Guard, strength (divisions in United States).... 400,115
   Annual admission rate per 1000 all divisions (disease only) 1,448.6
   Non-effective rate all divisions (all causes) 43.9
   Divisions showing admission rate for disease higher than average: Camps Bowie, Cody, Kearny, Wheeler, Doniphan, Shelby and Beauregard.
   Divisions showing non-effective rate all causes higher than average: Camps Bowie, Beauregard, Kearny, Shelby, Wheeler, Cody, MacArthur, and Sevier.
3. National Army, strength (divisions in United States).....433,951
   Admission rate per 1000 all divisions (disease only)..... 1,423
   Non-effective rate all divisions (all camps)..... 32.5
4. Venereal Disease:
   Annual admission rate Regulars in United States 97.4
   Annual admission rate National Guard (Divisions in U. S.) .. 100.7
   Annual admission rate National Army (Divisions in U. S.) .. 104.3
5. Number of Cases of Pneumonia 438
   Highest number in any one division, Bowie (36th Div.)..... 166
   Number of cases of meningitis 57
   Highest number in any one division, Funston (89th Div.)... 12

6. NEW CASES OF SPECIAL DISEASES REPORTED DURING THE WEEK ENDING NOV. 30, 1917

Division	Pneumonia	Dysentery	Malaria	Venereal	Paratyphoid	Typhoid	Measles	Meningitis	Scarlet Fever	Strength of Command
27th, Wadsworth..	2	...	...	367	...	...	....	...	...	31,725
28th, Hancock....	...	...	...	36	...	1	....	...	...	28,671
29th, McClellan...	1	...	...	16	...	...	7	2	3	25,820
30th, Sevier.....	68	...	...	12	...	...	344	3	...	27,387
31st, Wheeler.....	112	...	2	26	...	...	100	2	...	23,046
3d, MacArthur..	...	...	...	9	...	5	88	...	...	26,791
33d, Logan.....	17	1	2	87	...	...	9	...	...	32,888
34th, Cody.....	5	...	...	15	...	...	254	1	...	25,633
35th, Doniphan....	31	...	...	55	...	...	121	1	5	25,691
36th, Bowie.....	166	...	1	38	...	...	454	8	...	25,566
37th, Sheridan....	3	...	...	10	...	...	68	3	1	24,167
38th, Shelby.....	12	...	...	26	...	...	358	6	...	28,878
39th, Beauregard..	16	...	9	9	...	...	319	3	...	28,214
40th, Kearny.....	3	...	...	20	...	...	124	1	...	24,440
41st, Mills.....	11	...	...	49	...	...	61	...	4	26,338
76th, Devens.....	...	...	...	23	...	...	5	...	...	27,794
77th, Upton.....	2	...	...	23	...	...	5	...	...	24,646
78th, Dix.....	3	1	...	105	1	...	....	...	1	20,311
79th, Meade.....	5	...	...	3	...	...	27	...	...	32,864
80th, Lee.....	10	1	1	244	...	...	101	2	2	35,141
81st, Jackson.....	16	1	...	106	...	...	105	7	...	17 2.7
82d, Gordon.....	...	...	...	61	...	...	82	...	...	34,109
83d, Sherman.....	5	...	...	22	...	...	6	1	2	32 803
84th, Taylor.....	1	...	...	20	...	...	116	...	...	23,818
85th, Custer.....	...	...	...	7	...	...	32	...	1	19,421
86th, Grant.....	3	...	...	8	...	...	5	...	...	32,492
87th, Pike.....	38	1	44	39	...	...	236	...	66	25,326
88th, Dodge.....	13	...	...	33	...	...	50	...	4	18,211
89th, Funston.....	10	...	...	14	...	...	189	12	...	25,603
90th, Travis.....	27	...	1	150	...	...	....	...	...	30,076
91st, Lewis.....	14	1	2	33	...	...	61	5	4	37,105

7. ANNUAL RATE PER THOUSAND FOR SPECIAL DISEASES

	Regulars, U. S. Army, in U. S. only, 1916	Regulars in U. S., Week Ending Nov. 30, 1917	National Guard, All Camps, Week Ending Nov. 30, 1917	National Army, All Camps, Week Ending Nov. 30, 1917	American Expeditionary Forces, Week Ending Nov. 30, 1917
Pneumonia.....	2.59	9.3	36.5	17.6	14.2
Dysentery.....	3.97	0.0	0.1	0.5	0.4
Malaria.....	12.52	0.2	1.8	5.7	0.0
Venereal.....	91.00	97.4	100.7	104.3	75.8
Paratyphoid.....	0.31	0.0	0.0	0.1	0.0
Typhoid.....	0.21	0.2	0.7	0.0	0.0
Measles.....	20.29	24.0	299.5	123.4	60.3
Meningitis.....	0.29	0.2	3.8	3.2	3.8
Scarlet fever.....	0.59	5.0	1.6	9.5	3.0

Dec. 7, 1917

National Guard, strength (divisions in United States).....399,262
Annual admission rate per 1,000 (all divisions, disease only) 1,847.5
Non-effective rate (all divisions, all causes) 45.8
Divisions showing admission rate for disease higher than average: Camps Bowie, Cody, Kearny, Wheeler and Doniphan.

Divisions showing non-effective rate higher than average: Camps Bowie, Beauregard, Kearny, Shelby, Wheeler, Cody, MacArthur and Sevier.

National Army, strength (divisions in United States) 437,414
Annual admission rate per 1,000 (all divisions, disease only) 1,774.8
Non-effective rate (all divisions, all causes) 36

Divisions showing admission rate for disease higher than average: Camps Travis, Funston, Jackson, Pike, Dodge, Dix and Zachary Taylor.

Divisions showing non-effective rate all causes higher than average: Camps Funston, Travis, Pike, Jackson, Zachary Taylor, Dodge, Lewis and Lee.

Venereal Disease:
Annual admission rate National Guard (divisions in U. S.)... 77.1
Annual admission rate National Army (divisions in U. S.) ... 80.1

National Guard Divisions having rate above average: Camps Hancock, Bowie, Logan, Doniphan and A. L. Mills.

National Army Divisions having rate above average: Camps Upton, Lee, Gordon, Jackson, Dodge and Dix.

Number of cases of pneumonia 845
Highest number in any one division .....(36th Division) 464
Number of cases of meningitis 77
Highest number in any one division .....(81st Division) 16

6. NEW CASES OF SPECIAL DISEASES REPORTED DURING THE WEEK ENDING DEC. 7, 1917

Division	Pneumonia	Dysentery	Malaria	Venereal	Paratyphoid	Typhoid	Measles	Meningitis	Scarlet fever	Strength of Command
27th, Wadsworth..	3	...	...	22	...	...	19	...	...	31,665
28th, Hancock.....	1	...	...	45	...	1	1	...	...	28,575
29th, McClellan...	5	...	...	11	...	...	22	...	2	26,879
30th, Sevier.....	3	...	1	33	...	1	184	1	...	27,327
31st, Wheeler.....	76	1	2	34	...	...	106	3	...	23,355
32d, MacArthur..	2	...	...	22	...	9	153	...	...	26,078
33d, Logan.....	11	...	1	82	...	...	33	...	...	33,630
34th, Cody.....	17	...	...	10	...	...	341	...	2	28,521
35th, Doniphan....	21	...	1	58	...	...	285	2	2	25,601
36th, Bowie.....	464	...	...	154	...	2	844	15	...	25,336
37th, Sheridan.....	6	...	...	16	...	6	56	...	4	24,348
38th, Shelby.....	30	...	1	31	...	...	229	6	...	27,233
39th, Beauregard..	5	...	2	6	...	...	148	6	...	23,195
40th, Kearny.....	13	...	...	6	...	...	279	7	...	24,354
41st, A. L. Mills...	18	...	...	62	...	...	116	1	1	25,564
76th, Devens.....	...	...	1	34	...	...	13	...	...	27,752
77th, Upton.....	2	...	...	40	...	...	18	...	...	25,287
78th, Dix.....	...	...	1	109	...	2	2	...	...	20,859
79th, Meade.....	4	...	...	8	...	...	52	...	...	33,737
80th, Lee.....	1	...	...	87	...	...	169	1	1	33,172
81st, Jackson.....	41	...	...	88	...	...	138	16	...	18,440
82d, Gordon.....	5	...	...	64	...	...	164	...	...	33,352
83d, Sherman.....	7	...	...	46	...	...	11	...	2	32,573
84th, Taylor.....	5	...	1	12	...	...	140	...	...	23,327
85th, Custer.....	1	...	...	32	...	...	19	...	...	24,263
86th, Grant.....	2	...	...	9	...	...	6	...	...	22,768
87th, Pike.....	30	2	6	21	...	...	337	4	71	29,542
88th, Dodge.....	6	...	...	31	...	...	79	...	3	15,659
89th, Funston.....	8	...	...	17	...	1	221	9	2	27,346
90th, Travis.....	41	...	1	41	...	...	....	...	...	29,672
91st, Lewis.....	5	...	...	35	...	...	...	5	3	37,035

ORDERS TO OFFICERS OF THE MEDICAL CORPS

To Buffalo, N. Y., and Grand Rapids, Mich., to inspect properties offered as sites for hospitals, and on completion to his proper station, Major EDGAR KING.

To Baltimore, to command U. S. Army General Health Hospital No. 7, now being organized at Roland Park, that place, Lieut. GEORGE C. DUNHAM.

To Fort Riley, and report in person to the commandant, M. O. T. C., that post, for duty as commanding officer of evacuation hospital to be organized at that place, Lieut.-Col. HORACE D. BLOOMBARGH.

To Camp Jackson, Columbia,, S. C., and *to Asheville, N. C.*, to inspect Kenilworth Hotel, at that place, in regard to its suitability for hospital purposes, Col. HENRY C. FISHER.

To Erie, Pa., to conduct investigations on the efficiency of sterilizing apparatus and disinfectors at that place, and on completion to his proper station, Lieut.-Col. EDWARD B. VEDDER, Washington, D. C.

To report in person to the Surgeon-General of the Army, for duty in connection with the organization of a General Hospital at Lakewood, N. J., Col. JOSEPH H. FORD.

To Camp Bowie, Fort Worth, Texas, to investigate and report on the disease conditions at that camp, and return to his proper station, Col. WILLIAM F. LEWIS.

To Linda Vista, Calif., and report in person to the commanding general, Fortieth Division, Camp Kearny, that place, for duty as commanding officer of the base hospital at that camp, Lieut.-Col. FRED W. PALMER.

To Louisville, Ky., and report in person to the commanding general, Eighty-Fourth Division, Camp Taylor, that place, for duty as commanding officer of the base hospital, Lieut.-Col. WILL L. PYLES.

To Philadelphia, Pa., and *New York, N. Y.*, to inspect moving picture films and anatomic specimens for the Army Medical Museum, Washington, and return to his proper station, Col. WILLIAM O. OWEN.

ORDERS TO OFFICERS OF THE MEDICAL RESERVE CORPS

Alabama

To Camp Greenleaf, Fort Oglethorpe, for instruction, Lieuts. WILLIAM L. WAITES, Akron; JESSE A. GOODE, Albertville; JAMES A. CAMPBELL, Atmore; JOHN P. JONES, Camden; WILLIAM E. KIMBROUGH, Jr., Chatom, Washington County; HOSEA F. DOWNS, Clanton; KOSSUTH R. CAMMACK, Evergreen; CLAUDE G. GODARD, Fairhope; Mac McLENDON, Fort Mitchell; JOHN R. MORGAN, Heflin; SAMUEL S. GAILLARD, Perdue Hill; JULIUS O. BELUE, Rogersville; ALFRED C. SMITH, Shawmut; GILBERT A. RHODES, Troy; JOHN C. GODBOLD, Whatley.

To Camp Sevier, Greenville, S. C., from Fort Oglethorpe, for temporary duty in the base hospital, Lieut. HENRY P. HANNA, Birmingham.

Arizona

To Camp Kearny, Linda Vista, Calif., base hospital, Capt. LEON JACOBS, Yuma.

To Fort Riley, Kan., Lieut. GEORGE W. PURCELL, Tucson.

Arkansas

To Camp Lewis, American Lake, Wash., Lieut. PAUL E. JOHNSON, Holly Grove.

To Fort Riley, Kan., Lieuts. BERT C. HINER, Evansville; JOHN H. BAKER, Peach Orchard.

To St. Louis, Mo., School of Neurologic and Plastic Surgery, Lieut. MILES E. FOSTER, Fort Smith; *to Washington University*, from Fort Oglethorpe, Lieut. JOSEPHUS J. SHERRILL, Warren; and from Fort Riley, Lieut. WALLACE D. ROSE, Little Rock.

California

To Camp Greenleaf, Fort Oglethorpe, Ga., for instruction, from the Army Medical School, Lieut. CHARLES C. DICKINSON, McCloud.

To Camp Lewis, American Lake, Wash., Lieut. RUSSEL R. BURT, South Pasadena.

To Fort Riley, Kan., Lieuts. JOHN C. IRWIN, Los Angeles, and CORNELIUS T. DEVINE, Oakland.

Colorado

To Camp Funston, Fort Riley, Kan., from duty as a private at the same camp, Lieut. EUGENE H. BROWN.

To Camp Lee, Petersburg, Va., as member of board for tuberculosis examination, from Camp Sheridan, Capt. ALEXIUS M. FORSTER, Colorado Springs, Colo.

To Camp Sheridan, Montgomery, Ala., Base Hospital, Capt. HENRY W. HOAGLAND, Colorado Springs.

To Fort Riley, Kan., for instruction, Lieut. ARCHIBALD J. CHISHOLM, Antonio.

To Fort Leavenworth, Kan., for duty, from Fort Riley, Lieut. EDWIN D. BURKHARD, Delagua.

To Fort Riley, Kan., for instruction, Lieut. AUGUSTINE S. CECCHINE, Denver, Colo.

To the inactive list on account of being physically disqualified for active service, Lieut. FOREST C. KRACAW, Oak Creek, Colo.

Connecticut

To Army Medical School, for instruction in orthopedic surgery, from Fort Oglethorpe, Ga., Capt. JAMES L. MORIARITY, Waterbury.

To Camp Devens, Ayer, Mass., Base Hospital, Lieut. HAROLD L. BURR, Middletown.

To Camp Lewis, American Lake, Wash., from Fort Oglethorpe, Ga., Lieut. WALTER S. LAY, Hamden.

To St. Louis, Mo., Washington University, for instruction, from Fort Riley, Capt. ROBERT J. LYNCH, Bridgeport.

To Walter Reed General Hospital, Takoma Park, for instruction in tuberculosis examinations, Lieut. ELLIOTT H. METCALF, Rockville.

District of Columbia

To Philadelphia, Pa., for instruction in orthopedic surgery, Lieut. MARTIN H. SPELLMAN, Washington.

Florida

To Camp Lee, Petersburg, Va., from Camp Shelby, as a member of board for tuberculosis examinations, Lieut. JULIAN E. GAMMON, Jacksonville.

To Camp Wheeler, Macon, Ga., Lieut. WILLIS H. WATSON, Lakeland.

To Fort Monroe, Va., from Tenafly, N. J., Lieut. WILLIAM G. McKAY, Jacksonville.

To Fort Oglethorpe, Ga., Lieut. GROVER C. HARDIE, Fort Pierce.

To St. Louis, Washington University, for instruction, from Fort Oglethorpe, Capt. FRANCIS A. G. MURRAY, Lake City, Fla.

Georgia

To Fort Oglethorpe, Ga., for instruction, Capt. SIDNEY WALKER, Dublin; Lieuts. WILLIAM A. GIBSON, Jr., Agricola; GEORGE C. Brooks, Alpharetta; MOSES B. COPELOFF, Atlanta; SIGE EHRLICH, Bainbridge; CLEVELAND W. FINDLEY, Broxton; YOUNG C. LOTT, Ceilla; CHAPMAN Q. DYKES, Cochran; LUCIUS K. PATTERSON, Cuthbert; JOSEPH A. McGARITY, Draketown; OVID H. CHEEK, Dublin; ISAAC J. PARKERSON, Eastman; HAROLD R. LIPSCOMB, East Point; JOHN W. McELROY, Fitzgerald; ROLAND L. BROOKS, Geneva; LEE B. MATHEWS, Haw-

kinsville; CHALMERS HINTON, Lawrenceville; WILLIAM H. POWELL, Lumber City; LINTON C. McAFEE, Macon; WILLIAM T. FREEMAN, Matthews; JAMES K. PETTIT, Milledgeville; HENRY F. LYON, Mystic; ROBERT E. McCLURE, Norcross; JOHN W. DURDEN, Oak Park; ROY A. HILL, Pelham; ALBERT F. BRAWNER, Smyrna; HERBERT B. KENNEDY, Statenboro; VIRGIL W. OSBORNE, Stone Mountain; JAMES J. CRUMBLEY, Sylvester; LEMUEL J. JOHNS, Tallapoosa; CARL W. LUPE, Vienna; GEORGE W. KELLY, Washington; FRANCIS C. NESBIT, Waycross; JAMES D. DE LAMAR, West Point.

To Pittsburgh, Pa., for instruction in military roentgenology, from Chickamauga Park, Lieut. JAMES T. GALLOWAY, Atlanta.

Idaho

To Fort Riley, Kan., for instruction, Lieut. ROY E. MASON, Mackey.

To St. Louis, Mo., Washington University, for instruction, from Fort Riley, Capt. ERWIN W. KLEINMAN, Hailey.

Illinois

To Camp Cody, Deming, N. M., Base Hospital, from Fort Riley, Lieut. GUSTAVE A. FLORETH, Mt. Olive.

To Camp Custer, Battle Creek, Mich., from University of Pennsylvania, for temporary duty, Lieut. WILLIAM McMICKEN HANCHETT, Chicago.

To Camp Dodge, Des Moines, Iowa, Base Hospital, from University of Pennsylvania, Lieut. ERWIN R. SCHMIDT, Chicago.

To Camp Gordon, Atlanta, Ga., Base Hospital, from Fort Oglethorpe, Lieut. HERBERT L. WILLIAMS, Bartonville.

To Camp Grant, Rockford, Ill., as president of the board to examine troops for tuberculosis, Major CLARENCE L. WHEATON, Chicago.

To Camp Lewis, American Lake, Wash., from Fort Oglethorpe, Lieuts. FRANKLIN J. CORPER and SAMUEL B. LYONS, Chicago; FRANKLIN A. MARTIN, Tower Hill; from Fort Riley, CHARLES J. HIGINBOTHAM, Streator.

To Camp Meade, Annapolis Junction, Md., from Army Medical School, Lieut. GUY V. FORNEY, Walnut.

To Camp Mills, Garden City, L. I., N. Y., Forty-First Division, from Fort Sheridan, Lieut. LOUIS RUDOLPH, Chicago.

To Camp Sherman, Chillicothe, Ohio, as a member of board of tuberculosis examiners, from Camp Shelby, Capt. RUSSELL ADKINS, Chicago; for duty, from Fort Sheridan, Ill., Lieut. CHARLES D. ELDRED, Chicago.

To Chicago, Ill., and on completion, *to Fort Riley*, for instruction, Lieut. JOHN C. ROGERS, Chicago. *To enlist the enlisted personnel of Base Hospital No. 14*, Lieut. HAROLD E. JONES, Chicago.

To Fort Oglethorpe, Ga., for instruction, Lieut. THOMAS A. WAYLAND, Dallas City.

To Fort Riley, for temporary duty in the base hospital, Capt. THOMAS L. DAGG, Chicago. For instruction, Capts. CLARENCE W. GEYER, Aurora; FRANK A. PALMER, Morris; HUGH L. MARSHALL, Stronghurst; Lieuts. GEORGE F. RENDLEMAN, Anna; WALTER S. MIX, Beardstown; EDWARD F. FOX, ROBERT T. GAY, HOMER S. WARREN, Chicago; PAUL R. COPELAND, Creal Springs; ERNEST C. WHITE, Springfield; HARRY W. KINNE, West Chicago; from Camp Taylor, ELLIOT C. DU MARS, Peoria.

To Rockefeller Institute, for instruction, and on completion to his proper station, Major ALLEN B. KANAVEL, Chicago.

To St. Louis, Mo., School of Neurologic and Plastic Surgery, Capt. FRANK C. SIBLEY, Carmi.

To home from Camp Bowie, and honorably discharged on account of being physically disqualified for active service, Lieut. AUGUST C. ARMBRUSTER, Collinsville.

To home from Fort Riley and the inactive list, Lieut. LESLIE A. KUHN, Chicago.

Indiana

To Camp Dix, Wrightstown, N. J., Seventy-Eighth Division, for duty, from Fort Benjamin Harrison, Lieut. KARL C. EBERLY, Fort Wayne.

To Camp Fremont, Palo Alto, Calif., Base Hospital, from Fort Oglethorpe, Lieut. JOHN E. KELLY, National Military Home, Ind.

To Camp Kearny, Linda Vista, Calif., for duty, from Fort Oglethorpe, Lieut. EPHRAIM M. FOLSOM, Evansville.

To Camp Pike, Little Rock, Ark., Base Hospital, Lieut. HARRY BOYD-SNEE, South Bend.

To Fort Bliss, Texas, for temporary duty, from Washington University, St. Louis, Mo., Capt. GEORGE B. BREEDLOVE, Martinsville.

To Fort Oglethorpe, Ga., for instruction, Lieut. HENRY W. IRWIN, Indianapolis.

To Fort Riley, Kan., for instruction, Lieut. IRA E. BOWMAN, Odon.

To Montgomery, Ala., Aviation Mobilization Camp, for duty, from Fort Oglethorpe, Lieut. JULES L. BIERACH, Salem.

To New York City, Cornell Medical College, for instruction in military roentgenology, Lieut. CHARLES S. WOODS, Indianapolis.

Iowa

To Fort Riley, for instruction, Capt. WILLIAM M. WILDMAN, Fort Dodge; Lieuts. FRANK H. CAFFEY, Bradgate; ROLLIN S. FILLMORE, Corinth; ABRAHAM G. FLEISCHMAN and GEORGE S. GILPIN, Des Moines; JOHN F. SCHWERTLEY, Earling; LONNIE A. COFFIN, Farmington; EDWARD M. THIERLS, Granville; WALTER A. W. KRESENSKY, Greeley; WILLIAM W. WEBER, Hartford; MILLARD F. SMITH, Little Rock; MERL L. PINDELL, Macksburg; ERNEST D. COOK, Maquokata; JOSEPH C. FARRAGY, Mason City; JACOB J. SYBENGA, Pella; ALVIN H. HENDRICKSON, Sioux City; EDWIN E. WUTTKE, Sumner; FRANCIS S. COREY, Williams.

To Rockefeller Institute, for instruction, and on completion *to Camp Wadsworth*, Spartanburg, S. C., Lieut. MEREDITH B. MURRAY, Macedonia.

To his home and honorably discharged on account of being physically disqualified for active service, from Fort Riley, Capt. WILLIAM S. NORTON, Muscatine.

Kansas

To Camp Cody, Deming, N. M., Base Hospital, from Fort Riley, Lieuts. FREDERICK S. HAWES, Russell; WILLIAM G. BURTON, Wichita.

To Camp Devens, Ayer, Mass., Base Hospital, from Fort Riley, Lieut. EDWARD X. LINK, Junction City.

To Camp Meade, Annapolis Junction, Md., for instruction, Lieut. FREDERICK E. WRIGHTMAN, Sebetha.

To Camp Sherman, Chillicothe, Ohio, Base Hospital, from Fort Riley, Lieut. EARL L. VERMILLION, Tescott.

To Fort Riley, for instruction, Lieuts. CLAUDE F. HAYES, Arlington; WILLIAM K. FAST, Atchinson; OSCAR N. LIGHTNER, Benton; HERBERT H. PRICE, Coffeyville; LEO E. HAUGHEY and ROSS E. WEAVER, Concordia; JOHN H. HANSEN, Elkhart; EUGENE M. ADKINS, Galatia; NORMAN B. FALL, Gouda Springs; DAN M. FORBES and MAYRO O. HEDGE, Kansas City; CHARLES W. MATLOCK, Marion; HENRY H. HAERLE, Niles; JAMES A. HOCKADAY, Pratt; WINSTON G. RAMSEY, Protection; WALTER O. QUIRING, Shawnee; OSCAR L. ERICKSON, Topeka, and WILSON K. HOBART, Topeka.

Kentucky

To Camp Devens, Ayer, Mass., Base Hospital, from Fort Riley, Lieut. ISAAC J. HOOVER, Owensboro.

To Camp Lewis, American Lake, Wash., for duty, from Fort Oglethorpe, Capt. CHARLES B. KOBERT, Lebanon.

To Camp Sherman, Chillicothe, Ohio, Base Hospital, from Fort Riley, Lieut. LUTHER BACH, Jackson.

To Fort Oglethorpe for instruction, Capt. PORTER V. BALLOU, Rowena; Lieuts. EVAN G. GALBRAITH, Brooksville; HARRY P. HONAKER, Horse Cave; FREDERICK A. HOYER, Paducah.

To Fort Riley for duty, from Camp Taylor, Capt. PHILLIP H. STEWART, Paducah; for instruction, Capt. WILLIAM S. LITTLE, Owensboro.

To Fort Sill, Oklahoma, Base Hospital, for temporary duty, from Fort Oglethorpe, Lieut. HARRY L. PELLE, Louisville.

To Hoboken, N. J., for duty, from Camp Dix, Capt. JOHN L. PHYTHIAN, Newport.

Louisiana

To Camp Lewis, American Lake, Wash., for duty, from Fort Oglethorpe, Capt. JAMES C. BURDETT, Pelican; Lieut. IRENAEUS N. TUCKER, New Orleans.

To Fort Oglethorpe, Ga., for instruction in tuberculosis examination, Lieuts. PAUL B. LANDRY, Fort Allen; CORNELIUS P. MUNDAY, Shreveport.

To Fort Riley for instruction, Lieut. WILLIAM O. CALLAWAY, New Orleans.

Honorably discharged on account of being physically disqualified for active service, Lieut. ALLEN G. ZEAGLER, Olla.

Maryland

To Camp Taylor, Louisville, in base hospital, from Fort Des Moines, Major FRANK MARTIN, Baltimore.

To Fort Oglethorpe for instruction, Capt. RASTUS R. NORRIS, Crisfield; Lieuts. VERNON S. WILKINSON, Aberdeen; HOVHANNES K. PELTEKIAN, and JOHN H. TRABAND, JR., Baltimore.

To Fort Sam Houston, Texas, for temporary duty at Camp Stanley, Leon Springs, Texas, from Fort Oglethorpe, Lieut. LEO F. STEINDLER, Baltimore.

To Philadelphia, for taking moving pictures for instruction purposes, and upon completion to his proper station, Major ROBERT T. TAYLOR, Baltimore.

To Rockefeller Institute for instruction, Lieut. ROBERT S. CUNNINGHAM, Baltimore.

To St. Louis, Washington University, for instruction, from Fort Oglethorpe, Lieut. WILLIAM H. SMITH, JR., Hagerstown.

Maine

To Camp Shelby, Hattiesburg, Miss., for temporary duty examining the command, from St. Elizabeth's Hospital, Washington, D. C., Capt. FRANK E. LESLIE, Andover.

To Fort Oglethorpe, for instruction, Lieut. JOHN G. POTTER, Houlton.

Massachusetts

To Camp Dix, Wrightstown, N. J., for duty, Capt. RALPH A. WARDEN, Boston.

To Camp Doniphan, Fort Sill, Okla., for temporary duty in the base hospital, from Fort Benjamin Harrison, Lieut. NEWTON S. STERN, Boston.

To Camp Greene, Charlotte, N. C., in the base hospital, from Neurological Institute, Lieut. ALFRED P. CHRONQUEST, Hathorne.

To Fort Oglethorpe for instruction, Lieuts. JEROME J. McCAFFREY, Attleboro; EDWIN C. GILBERT, Indian Orchard; WILLIAM V.

KANE, Lynn; JAMES H. MURPHY, Palmer; WILLIAM T. McMAHON, Pittsfield.

To Hoboken, N. J., for duty, from Camp Merritt, Lieut. CLARENCE L. CHANDLER, Townsend.

To New York, N. Y., Neurological Institute for intensive training in brain surgery, from Camp Sevier, Lieut. HENRY R. VIETS, Boston.

To his home and honorably discharged on account of being physically disqualified for active service, from Camp Devens, Capt. CHARLES O. KEPLER, Boston.

Michigan

To Camp Cody, Deming, N. H., Thirty-Fourth Division, in the base hospital, from Camp Sherman, Capt. GRIFFITH A. THOMAS, Detroit.

To Camp Lee, Petersburg, Va., for duty in the base hospital, Lieut. CHARLES R. MUELLER, Detroit.

To Camp Lewis, American Lake, Wash., for duty, from Fort Riley, Lieut. JOHN F. DOUDNA, Lake City.

To Camp Sheridan, Montgomery, Ala., for duty, from St. Elizabeth's Hospital, Lieut. JAMES A. BELYEA, Detroit.

To Camp Sherman, Chillicothe, O., base hospital, from Camp Grant, Capt. CAREY P. McCORD, Detroit.

To Detroit, Mich., as a medical member of Examining Board and Recruiting Officer, Lieut. FRANK L. RYERSON, Port Huron.

To Fort Logan H. Roots, Ark., for duty, from Fort Sill, Okla., Major FRANK SUGGS, Detroit.

To Fort Riley for instruction, Capt. HENRY S. COLE, Whitehall; Lieuts. FRANK W. BROWN, Bay City; FREDERICK L. MORSE, Lake Odessa.

To New York City, Bellevue Hospital, for instruction on fractures and upon completion to New York City, for instruction in orthopedic surgery and upon completion to his home and the inactive list of the M. R. C., Lieut. JOHN T. HODGEN, Grand Rapids.

To Rockefeller Institute for instruction, and on completion *to Camp Upton*, L. I., N. Y., for temporary duty in the base hospital, Lieut. WILLIS L. DIXON, Benton Harbor.

Minnesota

To Camp Dodge, Des Moines, Iowa, for duty, from Minneapolis, Lieut. JAMES M. NORTHINGTON, Minneapolis.

To Camp Lewis, American Lake, Wash., for duty, from Fort Riley, Capt. JACOB F. AVERY, Minneapolis; Lieut. FRED B. COLEMAN, St. Paul.

To Camp Sherman, Chillicothe, O., base hospital, from Fort Riley, Lieut. ADOLPH F. DeTUNCA, Preston.

To Fort Riley, for instruction, Capts. ROBERT P. PEARSALL, Aurora; RUDOLPH H. WALD, Hastings; Lieuts. JOHN A. SAARI, Eveleth; URSUS V. PORTMANN, Jackson; Lieut. ALBERT M. LARSON, St. Paul.

To Milwaukee, Wis., Light Horse Squadron Armory, from Fort Riley, Lieut. WILLIAM J. EGAN, Rochester.

To St. Louis, Mo., Washington University for instruction, from Fort Riley, Lieut. LYNN J. WALKER, Wycoff.

To Washington, D. C., for duty, Major WILLIAM H. MAYO, Rochester.

Mississippi

To Camp Devens, Ayer, Mass., base hospital, from Fort Riley, Lieut. ELI E. FARMER, Dockery.

To Camp Lewis, American Lake, Wash., for duty, from Fort Riley, Lieut. FORNEY K. HOLLIS, Galtman.

To Fort Oglethorpe, Ga., for instruction, Lieut. WILLIAM L. ERVIN, Columbus.

To Fort Riley, Kan., base hospital, from Medical Officers Training Camp, Fort Riley, Lieut. ERNEST L. POSEY, Magee.

To his home and honorably discharged on account of being physically disqualified for active service, from United States Army General Hospital No. 1, Lieut. JOSEPH S. GATLIN, Laurel.

Missouri

To Camp Lee, Petersburg, Va., as member of board for examination for tuberculosis, from Camp Shelby, Lieut. ELBERT BAKER, St. Louis.

To Camp MacArthur, Waco, Texas, base hospital, from Fort Riley, Kan., Capt. EDWARD H. CLARK, Kansas City.

To Fort Riley, Kan., for instruction, Capts. LUTHER O. NICKELL, Macon; HUGH McCULLOCH, St. Louis; Lieuts. WALTER E. KOPPENBRINK, Alma; JOHN A. CORN, Amorest; GROVER C. JOHNSON, Belle; WALTER L. BRANDON, Borseley; CHARLES F. LYLE, Brownville; MITCHELL H. SHEBY, Charleston; FLOYD H. MAPLES, Clever; CARTER A. PROCTOR, Doniphan; CHARLES S. UNDERHILL, Franklin; FRANK A. ELDERS, Hematite; GEORGE F. COOPER, Kansas City; Lieuts. CHARLES F. DAVIS, HARRY W. DUGAY, FOREST F. FOSTER, ABRAHAM SALZBERG, JOHN H. WHITTAKER, Kansas City; RALPH E. MURRELL, Kirkwood; OTTO E. SCHOENFELD, Lathrop; FLOYD B. RICKETTS, Leslie; ROY J. OWENS, Millspring; ROY E. MYERS, Newtonia; ARCHIBALD R. STONE, Palmyra; CLARENCE J. LAWS, Princeton; ROBERT S. WILLIAMS, St. Clair; CHARLES E. MANESS, Stella; WILLIAM C. BRADLEY, HOWARD C. BRASHEARS, JAMES T. COOK, JAMES C. DONAHUE, ROY C. DRIPPS, ROLAND N. HOLCOMBE, SYDNEY S. LEVIN, EUGENE D. McCARTY, WALTER J. MELLIES, JOSEPH C. PADEN, FRED S. PERRINGS, MADISON J. PULLIAM, HERMAN RAMMING, JAMES C. RELINGTON, GEORGE L. RILEY, LOUIS W. SCHREIBER, RAYMOND B. T. SWEANY, JAMES C. THOMPSON, LEON V. URBANOWSKI, WILLIAM B. YORK, St. Louis; PAUL W. WIPPERMAN, Truesdale.

To Rockefeller Institute, New York City, for instruction and on completion *to Camp Greene*, base hospital, Lieut. JOHN L. REID, Kansas City; on completion *to Camp Hancock*, for temporary duty, Lieut. HARRY W. KING, Kansas City.

To St. Louis, Mo., School of Neurological and Plastic Surgery, for instruction, Capts. FRANK J. TAINTER, St. Charles; from Jefferson Barracks, IRA R. CLARK, St. Louis; from Fort Riley, Lieuts. CLAUDE J. HUNT, Kansas City; OWEN P. McPHERSON, Kansas City.

To his home and honorably discharged on account of being physically disqualified for active service, from Camp Funston, Lieut. JOSEPH A. BEEBE, Kansas City.

Montana

To Camp Lewis, American Lake, Wash., for duty, Lieut. CLYDE W. JUMP, Bozeman.

To Fort Riley, for instruction, Lieut. THOMAS M. MORROW, Medicine Lake.

To Camp Devens, Ayer, Mass., base hospital, from Fort Riley, Lieut. CHARLES B. EDWARDS, Overton.

Nebraska

To Camp Shelby, Hattiesburg, Miss., for temporary duty examining the command, from Phipps Clinic, Baltimore, Lieut. PAUL A. ROYAL, Lincoln.

To Fort Riley, Kan., for instruction, Capt. GLYNDEN A. YOUNG, Penea; Lieuts. MARTIN R. BROMAN, Axtell; CARROLL D. EVANS, Jr., Columbus; JAMES N. EVANS, Columbus; LESLIE B. CRUMRINE, Lincoln; CLINTON Q. DODD, Newport; AUGUSTUS C. BARRY, JOHN C. DAVIS, Jr., JACOB M. ERMAN, Omaha; WESLEY C. BECKER, Papillion.

To Hoboken, N. J., for duty from Cornell Medical College, WILLIAM H. MICK, Omaha.

To Omaha, Nebr., to enlist the enlisted personnel of base hospital No. 49, Capt. JOHN S. POTTS, Lieut. ABRAHAM GREENBERG, Omaha.

Nevada

To Camp Lewis, American Lake, Wash., for duty, from Fort Riley, Lieut. HERBERT A. ABBOTT, Reno.

New Jersey

To Camp Lewis, American Lake, Wash., for duty, from Fort Oglethorpe, Lieuts. ROBERT R. REED, Morristown; ABRAM B. ABRAMOWITZ, Newark.

To Camp Merritt, Tenafly, N. J., for duty in the base hospital, Capt. MICHAEL S. GRANELLI, Hoboken.

To Fort Oglethorpe, Ga., for instruction Capt. ALFRED G. SHEPPARD, Bridgeton; Lieuts. FRANCIS W. PIKE, Hoboken; FRANK J. RONAYNE, Orange.

To Picatinny Arsenal, Dover, N. J., for duty, from Fort Oglethorpe, Lieut. ERNEST A. L. DICKINSON, Trenton.

New Mexico

To Fort Riley, for instruction, Lieut. JAMES A. STEEL, Las Cruces.

New York

To Boston, Mass., for duty as medical member of Examining Board No. 1, from Plattsburg Barracks, Capt. WILLIAM W. LAING, Brooklyn.

To Camp Beauregard, Alexandria, La., Thirty-Ninth Division, in the base hospital, Lieut. JOSEPH E. CONNERY, New York.

To Camp Custer, Battle Creek, Mich., base hospital, Capt. LYNN S. BEALS, Buffalo.

To Camp Doniphan, Fort Sill, Okla., base hospital, from Fort Oglethorpe, Lieut. CARL KAPLAN, Brooklyn.

To Camp Greene, Charlotte, N. C., to examine the command for nervous and mental diseases, from Camp Greene, Lieut. ROBERT F. GAYLE, Jr., New York City.

To Camp Lewis, American Lake, Wash., for duty, from Fort Oglethorpe, Lieut. ARTHUR WEIL, Brooklyn.

To Camp Mills, Garden City, L. I., N. Y., base hospital, Capt. FRED M. MEADER, New York City.

To Camp Taylor, Louisville, Ky., for duty, from Fort Porter, N. Y., Major JUNIUS H. McHENRY, New York City.

To Camp Upton, L. I., N. Y., base hospital, Capt. MAX EINHORN, New York City.

To Fort Caswell, N. C., for duty, Capt. SPENCER FRANKLIN, New York.

To Fort Leavenworth, Kan., for duty in Dept. Laboratory, from Fort Riley, Lieut. DAVID M. KAPLAN, New York City.

To Fort Oglethorpe, Ga., for instruction, Major HARRY J. LIPES, Albany; Capt. WILLIAM B. REID, Rome; Lieuts. CARSON C. FAULKNER, Arena, Del. Co., N. Y., JAY L. TOUCHTONE, Blackwell's Island; WILLIAM M. ENNIS, ISIDORE D. HASKELL, ALLEN G. T. HIPPE, Brooklyn; JOHN H. WATSON, JOSEPH L. WOZNIAK, Buffalo; NELSON R. FRASIER, Glen Falls; ANTHONY LACOVARA, SAMUEL PALEG; THOMAS J. RYAN, HENDRIK VAN TENKEN STAM, New York City; FREDERICK B. BOND, Prattsburg; JASON H. CONGER, Utica.

To Fort Riley, Kan., for duty, from Army Medical School, Lieut. JAMES C. BARKER, New York City; from Fort Oglethorpe, Lieut. CHARLES G. DARLINGTON, New York City; for duty with Evacuation Hospital No. 7, Lieut. RANSLEY J. MILLER, New York City;

for temporary duty, and upon completion of this duty to his home and the inactive list, Lieut. FREDERICK L. GATON, New York City.

To Fort Sill, Okla., for duty, Lieut. EDWIN S. INGERSOLL, Rochester.

To New York City, American Social Hygiene Association for special duties in connection with venereal diseases, Capt. ALEC N. THOMSON, Brooklyn; *to Neurological Institute,* for instruction, from Fort Niagara, Capt. EDWIN G. ZABRISKIE, New York; *to Rockefeller Institute,* for instruction and on completion to Camp Hancock, base hospital, Lieuts. LEON E. DE YOE, New York City; on completion to Fort Oglethorpe, CHARLES JENNINGS, Elmira; on completion to Walter Reed General Hospital, Lieut. MICHAEL M. SCHULTZ, Astoria.

To St. Louis, Washington University, for instruction, from Fort Oglethorpe, Capt. HARRY R. STONE, New York City; from Camp MacArthur, Lieut. MAX BERNSTEIN, New York City.

To Walter Reed General Hospital, Takoma Park, D. C., for temporary duty, Capt. CALVIN M. KESSLER, New York City; for instruction in tuberculosis examination, Lieut. CHESTER F. DURYEA, Brooklyn.

To Washington, D. C., American Red Cross for duty, from Camp Mills, Major JOSEPH COLLINS, New York City.

To Williamsbridge, N. Y., United States Army General Hospital No. 1, for duty, from Allentown, Pa., Capt. CONDE DES. PALLEN, New York.

To his home and the inactive list from the office of the Surgeon-General, Major SIGMUND POLLITZER, New York City.

To his home and honorably discharged on account of being physically disqualified for active service, from Army Medical School, Lieut. HUBERT E. CHAUVIN, Brentwood.

North Carolina

To Camp Lewis, American Lake, Wash., for duty, from Fort Oglethorpe, Lieut. LELAND C. McINTOSH, Henderson.

To Camp Travis, Fort Sam Houston, Tex., from Fort Oglethorpe, Lieut. WILLIAM E. WISHERT, Charlotte.

To Fort Oglethorpe, Ga., for duty with Evacuation Hospital No. 5, Lieut. BEVERLY N. JONES, Walnut Cove; for instruction, Lieut. EDWARD J. WILLIAMS, Wingate.

To Hoboken, N. J., for duty, from Camp Greene, Lieut. SAMUEL H. LYLE, Franklin; from Camp Greenleaf, Lieut. JOHN B. BULLARD, Stedman; from Camp Mills, Lieut. WILLIAM H. SCRUGGS, Asheville.

To his home and honorably discharged on account of being physically disqualified for active service, from Camp Funston, Lieut. WILLIAM J. H. BOOHER, Oxford; from Fort Oglethorpe, Lieut. JAMES A. DIMMETTE, Walburg.

North Dakota

To Camp Lewis, American Lake, Wash., for duty, from Fort Riley, Lieut. JOSEPH H. PLANT, Montpelier.

To Fort Riley, Kan., for instruction, Capt. NICHOLAS J. SHIELDS, Walpeton.

To St. Louis, Mo., Washington University, for instruction, from Fort Riley, Lieut. WALTER L. BARBOUR, Deering.

Ohio

To Camp Sevier, Greenville, S. C., base hospital, from Camp Taylor, Capt. ELMER A. KLEIN, Norwood.

To Camp Shelby, Hattiesburg, Miss., base hospital, Lieut. CARL MULKY, Warrensville.

To Fort Oglethorpe, Ga., for instruction, Lieuts. JESSE GRIM, Akron; WILBUR G. CARLISLE, Bucyrus; JULIAN H. BUFF, Cincinnati; JOSEPH M. DUNN, JOHN D. KESSLER, Columbus; ALLEN G. CROW, Jacksontown; JOHN A. FILAK, Lakewood; EDGAR W. HILL, JR., Marietta; GEORGE A. HAVEMANN, New Bremen; CHARLES J. ROACH, Zanesville; for duty with Evacuation Hospital No. 3, Lieut. MATTHIAS A. WAGNER, Lima.

To Fort Riley, for instruction, Lieut. ALBERT F. SARVER, Greenville.

To Fort Sill, Okla., for duty as director of the Gas Defense Dept. from Infantry School of Arms, Major ROBERT CONARD, Blanchester.

To his home and the inactive list of the Medical Reserve Corps, from Fort Oglethorpe, Lieut. ISAAC P. SEILER, Piketon.

Oklahoma

To Camp Cody, Deming, N. M., base hospital, from Fort Riley, Lieuts. CHARLES W. ALEXANDER, Temple; WILLIAM J. OMER, Thomas.

To Camp Lewis, American Lake, Wash., for duty, from Fort Oglethorpe, Lieut. SAMUEL T. CAMPBELL, Anadarko.

To Camp Sherman, Chillicothe, O., base hospital, from Fort Riley, Lieut. ORANGE R. WELBORN, Kingston.

To Fort Riley, Kan., for instruction, Lieuts. WILLIAM STOUT, Enid; WILLIAM W. BRODIE, Tulsa.

To Oklahoma City, Okla., for instruction in orthopedic surgery, from Camp Doniphan, Lieut. JOHN A. WALKER, Shawnee; from Fort Brown; Capt. LEONARD S. WILLOUR, Alester.

To Rockefeller Institute, for instruction and on completion to Camp Devens, Lieut. ROBERT L. WESTOVER, Okmulgee.

Oregon

To Camp Lewis, American Lake, Wash., for temporary duty examining the command for mental and nervous diseases, from Camp Lewis, Lieut. DICK R. ROSS, Salem.

To Fort Riley, Kan., for instruction, Lieuts. EDWIN E. STRAW, Marshfield; IVAN E. BELLINGER, Sweet Home.

To Portland, Ore., to examine applicants for appointment in the Medical Reserve Corps, Capt. RALPH A. FENTON, Portland; to complete the enlistment of the enlisted personnel of Base Hospital No. 46, Lieut. EDWARD F. ZIEGELMAN, Portland; for duty, Lieut. KARL P. MORAN, Portland.

Pennsylvania

To Camp Cody, Deming, N. M., for duty, Lieut. HORACE PHILLIPS, Philadelphia.

To Camp Dix, Wrightstown, N. J., base hospital, from Camp Greenleaf, Capt. CLARENCE F. M. LEIDY, Philadelphia.

To Camp Greene, Charlotte, N. C., for duty, from Army Medical School, Lieut. JOHN J. MOORE, Pottsville.

To Camp Lee, Petersburg, Va., for duty in the base hospital, Lieut. JOSEPH F. O'NEILL, Philadelphia.

To Camp Lewis, American Lake, Wash., for duty, from Fort Oglethorpe, Lieuts. JOSEPH A. PESSOLANO, Philadelphia; ALFRED L. RHOADS, Scranton.

To Camp Pike, Little Rock, Ark., base hospital, from Fort Oglethorpe, Capt. SAMUEL I. EBER, Pittsburgh; Lieut. CHARLES E. HAYS, Johnstown.

To Camp Sevier, Greenville, S. C., for the purpose of examining the command in his specialty, from Psychopathic Hospital, Ann Arbor, Mich., Lieut. ERWIN H. ERNEY, Philadelphia.

To Camp Sherman, Montgomery, Ala., for duty, from St. Elizabeth's Hospital, Lieuts. EMORY L. DRAVO, Warren; from Fort Riley, CHARLES G. MOORE, Pittsburgh.

To Fort Oglethorpe, Ga., for instruction, Lieuts. CHARLES B. YOST, Bloomsberg; CLARENCE E. KING, Brick Church; WILLIAM C. BROWNE, Burnside; FRANK R. NOTHNAGEL, Chester; HARRY J. STOCKBERGER, Claridge; ARTHUR D. COWDRICK, Clearfield; J. MERLE EVERWINE, Clymer; WALTER M. BORTZ, Greensburg; CLAUDE W. McKEE, Greensburg; PETER E. EAGAN, Hazelton; JAMES F. TIMBLE, Jeannette; FRANK G. SCHARMANN, Johnstown; GARNETT P. MORISON, Latrobe; JOSEPH H. WYATT, Mahanoy City; JAMES J. O'CONNOR, Mildred; JOSEPH W. POST, Millersburg; FRANK H. GARDNER, Montrose; WILLIAM E. ANDREW, Penn Argyl; GERSHON GINSBURG, CARL F. KOENIG, WILLIAM C. KOSSLER, JOHN J. NEAL, JOHN R. QUAY, Philadelphia; CHARLES E. PEACH, Pine Grove; ABRAHAM FINKELPEARL, FREDERICK V. LICHTENFELS, WALTER A. MONNICH, MICHAEL M. WOLFE, Pittsburgh; ALFRED M. BERGSTEIN, Pottsville; CHARLES C. RYAN, Republic; JOHN F. PARK, South Bethlehem; PAUL G. L. HOCH, Tarentum; STACY H. RINEHARDT, Washington; BURGESS A. GIBSON, Washingtonville; CLARENCE H. KETTERER, Butler.

To Hoboken, N. J., for duty, from Camp Dix, Lieut. SAMUEL H. BOYD, Philadelphia; from Camp Greenleaf, Lieut. MOES T. KNAPPENBERGER, Pittsburgh.

To New York City, Neurological Institute, for intensive training in brain surgery, from Camp Beauregard, Capt. WILLIAM C. HEISEY, McKeesport.

To Oklahoma, Okla., for instruction in orthopedic surgery, from Chickamauga Park, Ga., Capt. CARSON COOVER, Harrisburg.

To Philadelphia, for duty with Base Hospital No. 30, from Jefferson Hospital, Capt. FRANCIS F. BORZELL, Philadelphia; *to Evans Dental Institute,* for instruction, and on completion to Camp Devens, Capt. CARLTON N. RUSSELL, Philadelphia.

To St. Louis, Mo., Washington University, for instruction, from Fort Oglethorpe, Lieut. ROBERT E. STRASSER, Reading.

To Walter Reed General Hospital, Takoma Park, D. C., to exhibit films showing the technic of dichloramin-T, and on completion of this duty to return to his proper station, Capt. WILLIAM H. FURNESS, Wallingford; Lieut. WALTER E. LEE, Philadelphia; for temporary duty from Evans Dental Institute, Lieut. ARTHUR T. HENRICI, Pittsburgh.

To his home and the inactive list, from Camp Greenleaf, Lieut. WILLIAM V. COYLE, Philadelphia; from Northwestern University, Lieut. SAMUEL McCLARY, 3d, Philadelphia.

South Carolina

To Fort Oglethorpe, Ga., for instruction, Major THOMAS R. MARSHALL, Columbia; Capt. MORGAN P. MOORER, Georgetown; Lieut. WILLIAM S. BURGESS, Sumter.

To Fort Riley, Kan., for duty with Evacuation Hospital No. 7, Lieut. HARRY E. JENKINS, Port Royal.

To Rockefeller Institute, for instruction, and on completion *to Camp McClellan,* Lieut. WALKER H. ROWE, Greenville.

South Dakota

To Fort Riley, Kan., for instruction, Lieut. HERSCHEL G. HARRIS, Wilmot.

Tennessee

To Camp Lewis, American Lake, Wash., for duty, Lieut. JAMES S. SKAGGS, Maynardville.

To Camp Sevier, Greenville, S. C., base hospital, from Fort Oglethorpe, Lieut. EUGENE M. ORR, Nashville.

To Fort Oglethorpe, for instruction, Lieuts. ELISHA FARROW, Bells; THOMAS C. CHAPMAN, Brownsville; JOSEPH H. CHANCE, Cedar Hill; JAMES L. JOHNSON, Chattanooga; WALTER A. BELL, Cloverdale; BENJAMIN B. WRIGHT, Covington; EMMETT E. BYRD, Jonesboro; HIRAM A. LAWS, JR., Lynchburg; FRED O. STONE, Maynardville; EDWIN C. GILLESPIE, Memphis; GROVER C. ENGLISH, Mount Pleasant; AAREIEL E. GOODLEE, Murfrees-

boro; JAMES L. BRYAN, JAMES D. LESTER, Nashville; WILLIAM E. McGAHA, Newport; IRA O. PARK, Union City; DANIEL C. HAGGARD, Unionville; SWAN BURRUS, Woodland Mills; for duty with Evacuation Hospital No. 4, JAMES D. L. McPHEETERS, Chattanooga; for duty with Evacuation Hospital No. 6, LEONARD A. CROSBY, Memphis.

To Fort Riley, Kan., for instruction, Lieut. CALVIN G. STRICKLIN, Clarendon.

To Rockefeller Institute, for instruction, and on completion to Camp Gordon, Atlanta, Ga., for temporary duty in the base hospital, Lieut. GROVER C. CONYERS, Gates.

To St. Louis, Washington University, for instruction, from Fort Oglethorpe, Capt. JAMES BREW, JR., Nashville.

Texas

To Camp Travis, Fort Sam Houston, for duty, from Camp Travis, Lieut. HENRY H. LOOS, Palacios.

To Fort Oglethorpe, Ga., for instruction, Lieut. BENJAMIN F. LARGENT, McKinney.

To Fort Riley, Kan., for instruction, Lieuts. ARCHER B. WORSHAM, Brashear; ROBERT E. FORESTER, Burleson; HARRY H. HENDRICKS, Dallas; MELVIN L. HUTCHISON, Dallas; OSCAR C. WEST, El Paso; LYLE J. LOGUE, Houston; JESSE G. JENKINS, Hubbard; JOSEPH J. ROBERTSON, Kingsville; MOULDON SMITH, Roby; JAMES P. McNULTY, San Angelo; WILBUR CARTER, Sherman; HUBERT FERRELL, Tyler; THOMAS V. JENNINGS, Winters, Runnells County.

To Fort Sam Houston, Texas, for temporary duty, from Fort Oglethorpe, Lieut. ELMORE B. GILBERT, Gorman.

To Fort Sill, Okla., as assistant to the director of the Gas Defense Department from Western Department, Lieut. ARTHUR W. C. BERGFELD, Sequin.

To Fort Worden, Wash., for duty, from Fort Oglethorpe, Lieut. EDWARD J. BURNS, Carrizo.

To New York, Neurological Institute, for intensive training in brain surgery, Lieut. WILLIAM W. SHORTAL, Dallas.

To Oklahoma, Okla., for instruction in orthopedic surgery, from Camp MacArthur, Lieut. MARION BROWN, Mexia.

To St. Louis, Washington University, for instruction, from Fort Bliss, Capt. CHARLES M. AYES, Houston; Lieut. JOHN C. THOMAS, Taylor.

Utah

To Salt Lake City, Aviation Section, Signal Corps, for duty, Lieut. ROBERT R. HAMPTON, Salt Lake City.

To St. Louis, Washington University, for instruction, from Fort Riley, Lieut. CLARENCE A. NYVALL, Salt Lake City.

Vermont

To Fort Oglethorpe, Ga., for instruction, Lieut. LEWIS F. McCARTHY, Essex.

Virginia

To Army Medical School, for instruction in orthopedic surgery, from Fort Oglethorpe, Lieut. FREDERICK P. SUTHERLAND, Richmond.

To Camp Devens, Ayer, Mass., base hospital, from Fort Riley, Lieut. IRA THOMAS, Aldie.

To Camp McClellan, Anniston, Ala., base hospital, from Fort Oglethorpe, Lieut. LESLIE T. RUSMISELLE, Lovettsville.

To Camp Mills, Garden City, L. I., base hospital, from Fort Riley, Lieut. THOMAS MILLER, Fincastle.

Washington

To Camp Kearny, Linda Vista, Calif., base hospital, from Camp Kearny, Lieut. PEARL C. WEST, Seattle.

To Fort Riley, for instruction, Capt. EDMUND S. WEST, North Yakima; Lieuts. ALVIA G. NACE, South Tacoma; JO BENNETT BLAIR, Vancouver.

West Virginia

To Fort Oglethorpe, Ga., for instruction, Lieuts. MILTON D. FLANARY, Charleston; GEORGE P. McCOY, Franklin; HOWARD M. BATSON, Handley; ESLEY T. LAKE, Nuss; WALTER S. LINK, Parkersburg; CHARLES L. MOORE, Upper Tract; COLIN R. WEIRICH, Wellsburg; MILTON E. JONES, Welch.

Wisconsin

To Camp Cody, Deming, N. M., base hospital, from Fort Riley, Capt. JOHN S. FOAT, Ripon.

To Camp Lewis, American Lake, Wash., for duty, from Fort Oglethorpe, Lieut. CLAUDE I. WHEATLEY, Milwaukee.

To Fort Riley, Kan., base hospital, from Fort Leavenworth, Capt. MILTON W. HALL, Mondovi; from Fort Riley, Lieut. CHARLES A. YATES, Bangor; for instruction, Lieut. GEORGE I. BADEAUZ, Spooner.

To Milwaukee, Light Horse Squadron Armory, from Fort Riley, Major OTHO A. FIEDLER, Sheboygan; Lieuts. JEFFERY J. BROOK, ULRICH SENN, Milwaukee.

To Rockefeller Institute, for instruction in laboratory work, from Camp Travis, Lieut. RALPH R. GILCHRIST, Milwaukee.

To his home and honorably discharged on account of being physically disqualified for active service, Lieut. ARTHUR C. DANA, Fond du Lac.

To his home and honorably discharged, from Camp Doniphan, Lieut. HARRY E. MacLAUGHLIN, Waupaca.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

COLORADO

New Hospital.—Dr. Frank P. Van Denbergh, Greeley, has opened a Red Cross Hospital in that city with accommodation for twenty patients.

Base Hospital Accepted.—The medical personnel of Base Hospital No. 29, which has been formally accepted by the War Department, includes Major John W. Amesse, Denver, director of the unit; Major Edward F. Dean, Denver, chief of the surgical service; Major Gerald B. Webb, Colorado Springs, chief of the medical service; Capts. Lewis H. McKinnie, Colorado Springs; Cuthbert Powell, Denver; Clarence B. Ingraham, Jr., Denver; Oliver Lyons, Denver; Cyrus L. Pershing, Denver; William W. Williams, Denver; John R. Espey, Trinidad, and C. W. Poley, Denver, and Lieuts. L. Marshall Van Meter, Robert G. Packard, Lawrence K. Lunt, W. M. Barre, William C. Finnoff, Amos L. Beaghler, Ranulph Hudston, Harold G. Macomber, Arthur W. Stahl, Leonard G. Crosby and Wilson Cuthbert, all of Denver.

GEORGIA

County Physicians Organize.—The physicians of Chattooga County met at Summerville, November 2, and organized the Chattooga County Society, with an initial membership of fifteen. Dr. Benjamin F. Shamblin, Lyerly, was elected president; Dr. Willard B. Medlin, Summerville, vice president, and Dr. H. D. Brown, Lyerly, secretary-treasurer.

Health Proclamation.—The October issue of the *Health Bulletin* of the Georgia State Board of Health contains on its first page a proclamation by the governor on the subject of health, in which he advocates a return to the simpler and saner habits of life, and urges that all persons aid the constituted authorities by giving active cooperation to the state board of health in its effort to conserve the health of the people.

Personal.—Dr. Robert W. Todd, LaGrange, has been elected health commissioner for Tift County, succeeding Dr. D. C. Whittle, resigned to enter military service.——Dr. Andrew L. West, Athens, has become a member of the medical staff of the Macon Hospital, succeeding Dr. Francis Y. Herrington, Atlanta, resigned to enter military service.——Dr. Edward M. Green, clinical director of the Georgia State Sanatorium, Milledgeville, has resigned to accept the position of superintendent of the Pennsylvania State Hospital for the Insane, Harrisburg.——Dr. William A. Ellison, Milledgeville, physician to the State Reformatory, and health commissioner of Baldwin County, has resigned to enter the United States Public Health Service, and has been succeeded as health commissioner by Dr. George L. Chapman and as physician to the State Reformatory by Dr. Guy D. Compton. ——Dr. Charles Wardell Stiles, U. S. P. H. S., Washington, D. C., has reported for duty to the Twenty-Eighth Division, Augusta, to take charge of the health situation in the zone contiguous to Camp Hancock.

ILLINOIS

In Memory of Gochnaur.—Memorial services were held in the First Presbyterian Church, Freeport, November 25, under the joint auspices of the church and Masonic fraternity in memory of Lieut. Orlando M. Gochnaur, M. R. C., who was killed in action while attached to the British Expeditionary Forces in France. A popular subscription has been appointed in Freeport for the erection of a monument for Dr. Gochnaur.

Personal.—Dr. Gustav F. Ruediger, director of the Hygienic Institute for La Salle, Peru and Oglesby, has resigned to become director of the State Hygienic Laboratory at the University of Nevada, Reno.——Lieut. Wallace A. Belsey, Belvidere, medical director with the British Forces, is reported to have been wounded.——Dr. Vera V. Norton, for four years resident physician of the Edward Sanatorium, Naperville, has been appointed one of the superintendents of the Cincinnati Tuberculosis Sanatorium.

Legal Opinions Concerning Sanatorium Tax Levies.—The attorney-general of Illinois has given an opinion to the State

Department of Public Health to the effect that under the Illinois sanatorium law counties which have made tax levies for sanatorium purposes, and which need the money now to proceed with their plans, may lawfully anticipate the 1918 spring tax collections with warrants drawn for immediate use. It has also been held, however, that counties which made their sanatorium levies in September cannot at any later meeting during the year increase the levy. Another holding is that where counties have made levies for sanatorium purposes, but have not sufficient funds to build a county sanatorium, such counties may pay out of the sanatorium fund the expenses of persons sent to sanatoriums in other counties of the state, but not outside the state.

Chicago

Fire at Medical Supply Depot.—A fire, presumably of accidental origin, destroyed the new warehouse of the medical supply depot at Fortieth and Federal streets, with a loss of about $100,000.

Women Physicians Entertain.—Sixty medical women of Chicago were guests of the Medical Women's Club of Chicago and the After Dinner Club at the College Club, December 12. A dinner and entertainment made up the program.

Dinner to Colonel Raymond.—A complimentary dinner was given by Major Daniel A. K. Steele, president of the Illinois Division, M. R. C., U. S. Army, in honor of Col. Henry I. Raymond, department surgeon, Central Department, December 12, at the Hotel La Salle.

Proceedings of the Institute of Medicine.—Volume I of the *Proceedings of the Institute of Medicine of Chicago*, a book of 168 pages, covering the year 1916-1917, has just appeared. It covers seven meetings and contains fourteen papers with discussions, and the obituaries and portraits of Dr. Henry B. Favill and Theodore B. Sachs. The roster of members lists 202.

Reporting Venereal Diseases.—The city ordinance of June 29, 1917, requires the reporting of venereal diseases to the board of health. In order to carry out the provisions of the ordinance the health department has prepared and mailed to all physicians within the city a postal card blank on which to report cases, a blank form of letter from one physician to another, to inform the latter that a patient treated by him has consulted the former, a form letter to report to the department of health that a patient has not reported to the physician and that ten days have passed since the time agreed on, and a pamphlet concerning venereal diseases for distribution to patients.

KANSAS

Typhoid Fever.—It is reported that there are 300 cases of typhoid fever in Eldorado, and that antityphoid inoculation has been given to 2,000 of the inhabitants.

Personal.—Dr. William S. Lindsay, Topeka, has qualified as medical examiner for the first district appeal board, succeeding Dr. Samuel J. Crumbine, secretary of the state board of health.——Dr. Albert C. Johnson, Kingman, coronor of Kingman County, has been appointed county physician, succeeding the late Dr. Newton C. Davis, Kingman.

IOWA

Personal.—Dr. Alexis N. Warren, Sioux City, sustained painful injuries, November 20, when his motor car was run into by another automobile. Dr. Warren is under treatment in the Samaritan Hospital.——County Physician Frank O. Burke of Scott County has resigned.

Hospital Opened.—The informal opening of the Iowa Congregational Hospital, Des Moines, took place, November 23. The hospital has just been completed at a cost of nearly $10,000. The date of the formal opening of the hospital is not yet fixed.

MASSACHUSETTS

Advisory Committee Appointed.—A committee of five physicians, consisting of Drs. Albert Evans, Boston, chairman; Dr. John T. Williams, Boston, secretary; Dr. Frank G. Wheatley, North Abington; Arthur A. Howard, Boston, and Dr. Harry Linenthal, Boston, has been appointed to cooperate with the industries in the work of protecting workers of the state against ill health, loss of time, accidents, sickness and death. One of the duties of this committee will be to see that the laws for protecting the health of workers are enforced in the state.

Personal.—Dr. Harry J. Hagerty has been appointed substitute ambulance surgeon in the Worcester police department, succeeding Dr. Robert J. Northridge, who has been made ambulance surgeon, vice Dr. Joseph A. Smith, resigned to enter military service.——Dr. Willard B. Howes, assistant superintendent of the Rutland State Sanatorium, has resigned to become school medical supervisor for the community health service at Framingham, and has been succeeded by Leon A. Alley, Boston.——Dr. Hiram L. Horsman, Worcester, has been appointed acting superintendent of the Grafton State Hospital, succeeding Dr. James V. May, Worcester, resigned to accept the position of superintendent of the Boston State Hospital.

Merger of Harvard and Technology School Forbidden.—The supreme court of Massachusetts has decided that Harvard University has no right to support the merger of the Lawrence Scientific School with the Massachusetts Institute of Technology from the Gordon McKay bequest, an arrangement which was put into effect some time ago, and under which Harvard abolished the Lawrence Scientific School. The decision is on the petition of Harvard to have the court ratify the agreement between the two institutions. In the opinion, written by Judge DeCourcy, it is said that Mr. McKay intended that not only the investment of the endowment fund, but the education which his endowment was to make possible, should be under the control and direction of the university, its government and administration. He selected as a trustee to carry out his purpose a great educational institution, one whose ability adequately to carry out his plans he was familiar with, and with whose historic name he desired to associate his own in perpetual memory. Harvard will now have to reestablish a school of applied science under its own administration.

MINNESOTA

Smallpox.—There were said to be forty-eight cases of smallpox in St. Paul, November 28.

Personal.—Dr. Carl J. Holman, Mankato, who suffered a fracture of three ribs and an injury of the lung in an automobile accident, recently, is reported to be doing well.

Medical Board Appointed.—Dr. Archibald MacLaren, St. Paul, has been appointed chairman, and Dr. Arthur S. Hamilton, Minneapolis, secretary of the Minnesota state committee on the organization and supervision of state medical advisory draft boards, and other members of the committee are Drs. William H. Magie, Duluth, Dr. John H. Adair, Owatonna, and Alfred E. Spalding, Luverne.

Social Hygiene Commission Appointed.—Governor Bernquist has appointed the following physicians as members of the bureau for disease control of the Minnesota Social Hygiene Commission: Drs. Richard O. Beard, Elexions T. Bell, Albert J. Shesley, William A. Jones and Leonard G. Rowntree, Minneapolis; Drs. Henry M. Bracken and Charles D. Freeman, St. Paul; Dr. Edward L. Tuohy, Duluth, and Dr. Charles H. Mayo, Rochester, and as a committee on education, Drs. Henry W. Cook and Samuel E. Sweitzer, Minneapolis.

MONTANA

Personal.—Dr. Ellis A. Johnston has resigned as city physician of Helena.——Dr. Sidney A. Cooney has been appointed a member of the board of health of Helena.

The Mineral County Leper.—The United States Public Health Service has notified the state health board that no federal action can be taken in the case of Senator O. J. Willett of Mineral County, who is suffering from leprosy. Senator Willett will be isolated in his own county at a location approved by the state board of health.

Scarlet Fever and Smallpox.—Scarlet fever is reported to be epidemic in Billings.——There are said to have been 102 cases of scarlet fever reported to the board of health of Helena since May 1. Of these, thirty-four patients are now under quarantine. The apex of the epidemic was in the middle of October, when there were sixty patients under quarantine.——Smallpox is reported to be prevalent in Corvallis, where more than forty patients are under treatment. ——The threatened epidemic of smallpox in Livingston is under control. There are now nine patients under quarantine and two suspected cases are under surveillance.

NEBRASKA

New Hospitals.—Mrs. William Glover, Aurora, has made an offer to the city council to turn over her home to the city

for a hospital, on condition that it shall be made fireproof, shall be open to all citizens on equal terms, and subject to her approval. The house contains eleven rooms, is heated by hot water, and lighted by electricity.——The Glasgow General Hospital, Hastings, is now open and ready to receive patients.

Personal.—Charles R. Robel, manager of the Lord Lister Hospital, Omaha, was killed by the overturning of his automobile near Oakland, Iowa, November 30.——Dr. William S. Yager, Nebraska City, has been appointed physician for the School for the Blind, Nebraska City, succeeding Dr. Claude Watson, deceased.——Dr. Arthur C. Stokes, Omaha, has been appointed, by the Omaha Red Cross Chapter, director of the hospital unit which has recently been organized by the Surgeon-General.——Dr. Lawrence B. Pillsbury, assistant superintendent of the Lincoln State Hospital, has been appointed superintendent of that institution, succeeding Dr. Benjamin F. Williams.

NEW JERSEY

Personal.—Dr. Francis B. Husted, Salem, was painfully injured by the overturning of his car, November 20.——Dr. John R. Stevenson, Haddonfield, who sustained serious injuries in a fall, recently, is reported to be improving.

Physicians Win Suits.—In the case of Henry Pendl, who brought suit against Dr. Halvor L. Harley, Pleasantville, for $10,000 for the death of his son, claiming negligence on the part of the physician, the jury, November 21, returned a verdict in favor of Dr. Harley.——The jury in the case of Capt. William J. Condon, M. R. C., U. S. Army, New Brunswick, charged with the murder of John V. Piper, a Rutgers College student, returned a verdict of not guilty, October 27.

NEW YORK

State Association Meeting.—The Medical Society of the State of New York announces that its annual meeting will be held in Albany in the week beginning May 20, 1918.

Lobar Pneumonia Reportable.—According to the *Bulletin* published by the Buffalo Health Department, November 24, lobar pneumonia is declared a reportable disease, requiring quarantine.

Rockaway Physicians Organize.—The physicians of Rockaway have organized the Medical Association of Rockaway Beach, and elected the following officers: president, Dr. Frank P. Hatfield, and secretary, Dr. Abraham Goldberg.

Medical Staff for Home Defense Corps.—The following medical staff has been appointed by the Erie County Home Defense Committee: Major Earl P. Lothrop, and Capts. Almon H. Cooke, Frank B. Rasbach and Lawrence Hendee, all of Buffalo.

Personal.—Dr. Jason Parker has resigned as superintendent of the Jones General Hospital, Jamestown.——Lawrence S. Hill, physical director of the Albany public schools, has been elected president of the New York Association of Medical Inspectors and physical directors.——Dr. Walter M. Clark has succeeded Dr. Joseph N. B. Garlick as health officer of Schenectady.——Dr. Charles V. Patchin, who has been seriously ill at his home in Dansville, is reported to be improving.

Pneumonia Unusually Prevalent.—Dr. Hermann M. Biggs, state health commissioner, has issued a statement in which he predicts a high rate from pneumonia this winter. His prediction is based on the record of recent winters. In October there were 282 more deaths from this cause than in September, and 171 more than the average for October in the last five years. The importance of recognizing that pneumonia is a communicable disease and of acting in accordance with this fact is urged, and also that it is essential in guarding children against this disease that they be kept in the best state of nutrition and comfort. Figures published by the department, December 4, show that for the first week in December this year there were 249 cases reported as against 184 for the corresponding week of 1916 and 165 for the corresponding week of 1915. According to the city records the death rate from pneumonia is low among Germans, Russians and Hungarians; it is three and one-half times as high among Italian children as among children of German mothers, three times as high as among children of Russian, Austro-Hungarian or Irish mothers, and a little more than double that of American mothers. Attention is called to fatigue, chilling, overcrowding and the use of alcoholic beverages as factors favoring the development of the disease. The statistics show that the mortality from pneumonia among drinking men is twice what it is among abstainers.

New York City

Personal.—Dr. J. Ramsay Hunt has been appointed consulting neuropathologist to the Craig Colony for Epileptics, Sonyea, N. Y.——Dr. William H. Maxwell, superintendent of schools in Brooklyn, who has been seriously ill in Flushing Hospital, is reported to be convalescent.

New Day Camp for Tuberculosis.—Under the auspices of the Society for the Prevention and Relief of Tuberculosis, the Boat Committee formally opened a new day camp for the care of tuberculous patients, the "Manhattan," at the foot of East Ninetieth Street, December 6. Addresses were made by Health Commissioner Dr. Haven Emerson, Dr. Hermann M. Biggs, health commissioner of the state of New York, and Dr. Louis I. Harris.

Order Hospitals at Munition Works.—The subcommittee on industrial diseases, poisons and explosives of the Council on National Defense met at the Hotel McAlpin in New York, December 1, when it formulated recommendations for presentation to the Council on National Defense. The recommendations provide that all munition plants shall establish hospitals for the care of their employees, and restaurants in which the workers may eat under sanitary conditions. It is also recommended that the work in the plants be so regulated that the workers do not come in direct contact with nitro and amido compounds.

New York Academy of Medicine Elects.—The stated meeting of the New York Academy of Medicine, December 6, was the occasion of the annual election. The term of office of the president, Dr. Walter B. James, does not expire until Jan. 1, 1919. The officers elected were: vice president, Dr. John A. Hartwell; corresponding secretary, Dr. D. Bryson Delavan; treasurer, Dr. Seth M. Milliken; trustee, Dr. L. Emmett Holt; member of Committee on Admission, Dr. Godfrey R. Pisek, and member of Committee on Library, Dr. Herbert S. Carter.

OHIO

Insurance Committee Appointed.—The Ohio State Medical Association has appointed the following committee to cooperate with the State Health and Old Age Commission: Drs. Walter H. Snyder, Toledo; Otto P. Geier, Cincinnati, and Gilbert E. Robbins, Chillicothe.

Personal.—Dr. H. Wadsworth Dornan, Ashtabula, is reported to be seriously ill in St. Petersburg, Fla.——Dr. Oscar H. Sellenings, Columbus, now on duty with the American Red Cross in France, has begun a study of the milk situation in that country.——Dr. Harry E. Cover, Bantam, was thrown from his buggy in a runaway accident, November 19, fracturing his leg below the knee.——Dr. John C. Darby, Cleveland, recently suffered a slight cerebral hemorrhage, and is confined to the house.

Club Takes Action on Medical Corps.—The Exchange Club of Toledo at a recent meeting adopted resolutions, introduced by Dr. Charles M. Harpster, Toledo, urging its senators and congressmen to support the bill to be introduced in the coming session of Congress, which provides that the medical officers of the Army shall have the same rank that prevails in the Medical Corps of the Navy; that out of 10,000 medical officers in active service there shall be twenty-five major-generals, twenty-five brigadier-generals, 400 colonels, 800 lieutenant-colonels, 2,350 majors, 3,200 captains, and 3,200 first lieutenants; that medical officers shall be equal in rank and authority with officers of the line, and that these provisions shall apply both to the regular service and the Medical Reserve Corps.

PENNSYLVANIA

Health Insurance Commission.—Governor Brumbaugh, October 16, announced the appointment of a commission to study health insurance and report to the next legislature. The members are Hon. William Flinn, Pittsburgh; William Draper Lewis, Philadelphia, and Dr. John B. McAlister, Harrisburg.

Mütter Lecture.—The Mütter Lecture on surgical pathology for 1917 was delivered in Thomson Hall of the College of Physicians, December 14, by Dr. Chevalier Jackson, Philadelphia, on "Observation of the Pathology of Foreign Bodies in the Air and Food Passages, Based on the Observation of 628 Cases." The lecture was illustrated by specimens, lantern slides, roentgenograms and color drawings.

Personal.—Dr. James D. Kiefer, Mount Carmel, is ill with gastric ulcer.——Dr. Fulton R. Stotler, has resigned after twenty-eight years of service as a director of the Wilkinsburg Board of Education.——Dr. Samuel G. Dixon, who has been ill at the University Hospital, Philadelphia, for three months, left the institution, November 27, greatly improved in health.

——Dr. John L. Sagerson, Johnstown, who was injured in an automobile accident recently and was under treatment in the Mercy Hospital, is reported to be convalescent.——Dr. Carlton H. Davidson, New Salem, who is serving on the western front in France, was gassed by a German shell and was partially blinded for one week.

Smallpox.—During the last week in November there were sixty cases of smallpox in twelve counties in Pennsylvania. ——The number of cases at Blue Ball, Lancaster County, increased in two days from eleven to twenty-one cases. The state health commissioner has issued the following warning regarding smallpox: "The state should realize it now has a patriotic duty to perform in stamping out smallpox. Our agents throughout the state are competent and active men but they can do little if the public fails to do its part. The present smallpox epidemic in Clearfield County and surrounding neighborhood is directly due to the fact that a case of smallpox which came into the state from Ohio was secreted and the knowledge of it kept from the health authorities." ——The quarantine on the Pennsylvania Railroad Construction at Gallitzin, where nearly 100 men have been held for two months, was lifted, November 23.

Philadelphia

Hospital Campaign.—On the first of its ten-day campaign to raise $50,000, St. Timothy's Hospital obtained $30,538, over 60 per cent. of the amount desired.

Result of State Examination for Optometrists.—Under the new state optometry law the examination recently held at the Central High School showed that several hundred would fail to get licenses. A number of the applicants could neither read nor write English.

Personal.—Dr. Frank C. Hammond, Philadelphia, has been appointed a member of the board of health to serve during the absence in France of Dr. Alexander C. Abbott.——Dr. William W. Keen has declined the renomination of president of the American Philosophical Society, after serving ten years in that capacity.——Major Arthur C. Christie, M. R. C., Surgeon-General's Office, Washington, D. C., and Dr. George M. MacKee, New York, addressed the joint meeting of the Philadelphia County Medical Society and Philadelphia Roentgen-Ray Society at the College of Physicians Building, December 12.——Dr. Edward E. Montgomery addressed the Atlantic County Medical Society at the stated monthly meeting, held at the Chalfonte Hotel, Alantic City, December 14.

SOUTH DAKOTA

New Hospital.—The new Methodist Episcopal Hospital at Mitchell was dedicated, December 9. The building has cost about $100,000, and will accommodate more than 100 patients.

Personal.—Dr. Arthur J. Jackson, Lead, has been appointed a member of the State Board of Health and Medical Examiners, succeeding Dr. Felix E. Ashcroft, Deadwood, term expired.

New District Society Officers.—The Seventh District Medical Society held its annual meeting and banquet in Sioux Falls, December 3, and elected Dr. Joseph G. Parsons, Sioux Falls, president; Dr. George W. Bliss, Valley Springs, vice president, and Dr. Goldie E. Zimmerman, Sioux Falls, secretary.

VIRGINIA

Personal.—Dr. Edward W. Rawls, Churchland, has succeeded Dr. Sherwood Dix, Port Norfolk, as a member of the Norfolk County Board of Health.

Medical College Admits Women.—A report states that the faculty of the Medical College of Virginia of Richmond at a recent meeting voted to admit women students.

CANADA

Military Hospitals Under Army Medical Corps.—Final arrangements have been completed whereby the Canadian Military Hospitals Commission is handing over to the Canadian Army Medical Corps the care of all wounded and sick soldiers in Canada.

Hospital News.—A new military hospital is to be built in High Park, Toronto, where there are available 25 acres of land. It is to be constructed on the plan of the Ontario Military Hospital at Orpington, England. Accommodation will be provided for 1,000 beds, and buildings of four or five stories will be built in connection with an administration building. The hospital will cost about $300,000, and two months will be required to get the buildings in condition for the reception of patients.

Personal.—Capt. George Ewart Wilson, Toronto, who was with the University of Toronto Base Hospital at Saloniki, and lately in England, has returned to Toronto.——Col. Frederick W. Marlow, formerly A. D. M. S., Toronto Military District, has been ordered by the Militia Department of Canada to Halifax, where he will be engaged in caring for the injured in the recent disaster which has swept over that city.——So far as yet announced, Dr. Murdoch Chisholm, one of the leading physicians of Halifax, is the only physician of the city whose name is included in the list of those who lost their lives in the Halifax disaster.——Dr. Charles J. C. O. Hastings, M. O. H., Toronto, despatched three nurses immediately to help at Halifax, and another twenty-five nurses will leave in a day or two.

GENERAL

Once More a Warning.—The Journal has repeatedly warned its readers of a subscription swindle worked on physicians and others. The individual presents himself as a contestant for a prize in the form of a scholarship to be awarded by an educational association to the one obtaining the most subscriptions in a certain length of time. It is worked under different names; we have called attention to it as the National Educational Association, Cornell Educational Association, The United Students' Aid Society. The latest is the Advance Society of the University of Illinois, with a military angle. The solicitors, two well-dressed young men, represent themselves to be contestants for a scholarship in an Army school. May we again suggest that those who would avoid being swindled should avoid paying money to traveling men whom they do not personally know?

Peroral Endoscopists Organize.—November 1, the Clinical Association of Peroral Endoscopists was organized in Philadelphia. The objects of the society are "The study of diseases and accidents occurring in the respiratory and upper digestive tracts, of borderline conditions and their treatment, medical and surgical, by direct inspection." The association also aims to impress on the internist and general practitioner the value of bronchoscopy and esophagoscopy as diagnostic methods of precision, to make possible the accurate ocular study in the living subject of the pathologic condition of the esophagus and lungs. The officers of the association are as follows: president, Dr. Chevalier Jackson, Philadelphia; vice president, Dr. Hubert Arrowsmith, Brooklyn; secretary-treasurer, Dr. Henry L. Lynah, New York, and members of the executive committee, Drs. Wolff Freudenthal, New York, and Samuel Iglauer, Cincinnati.

FOREIGN

The Milk and Coal Card Plague.—The *Nederlandsch Tijdschrift* relates that an Amsterdam physician, complaining of the plague of certificates he is called on to fill out, states that eighty-nine requests for a milk certificate reached him in one mail. Each required investigation as to the reasons why the extra milk should be granted the applicant. He gave one man with stomach disease a certificate entitling him to sick benefit, and the man presented it to the coal control bureau and obtained 2 tons of coal on the strength of it—the first time that anthracite was deemed a stomachic.

Federation of Foundling Asylums in Italy.—A national gathering of the officials of the *brefotrofi*, the foundlings' asylums, of Italy was held recently at Rome. Steps were taken for a federation of these institutions throughout the country. Among the measures voted was an appeal to the government to extend to adopted children under 12 the financial aid now given to the other dependents of soldiers. The question of care of syphilitic infants, advisability of colonies for them and prophylaxis of infection of others were among the subjects discussed, as also the necessity for more effectual measures for research as to the paternity.

The Leipziger Verband.—According to the *Nederlandsch Tijdschrift*, the Leipziger Verband recently convened for the first time since the war began. Of the officials and representatives of the organization, seventy-four have perished. There are now 25,800 members. Hartmann is still the president, and he urged physicians to make every effort to get the sickness insurance societies to found diagnostic laboratories. The Verband voted to establish an old age pension bureau, also to sustain in every way the dispensaries that have been opened for diagnosis and advice, especially for venereal diseases, without giving treatment. The meeting also went on record as opposing the idea of the practice of medicine becoming a state department, saying that the medical profession is best practiced when the physician can advise the sick man as a free and independent consultant.

PARIS LETTER

PARIS, Nov. 15, 1917.

The War

TREATMENT OF INFECTED WOUNDS WITH JAVEL WATER

At a recent meeting of the Académie des sciences, Dr. Cazin, formerly chief of the surgical clinic at the Hôtel Dieu, and Mlle. Krongold presented an interesting communication on this subject. They are of the opinion that the use of diluted Javel water in the treatment of infected wounds has been wrongly condemned as being irritating. As a matter of fact, Javel water, in sufficient dilution, is not irritating at all. Daufresne used a very strong solution, but Cazin uses a 15 per thousand solution, which does not have any deleterious effect on human skin, even when in contact with it for twenty-four hours. Histologic examination showed that skin so treated was absolutely normal. On the other hand, skin similarly treated for twenty-four hours with Dakin's solution, the hypochlorite solution of Daufresne, or a solution of Javel water containing the same amount of sodium hypochlorite as Daufresne's solution shows, on microscopic examination, complete destruction of the epidermis and of the papillary layer as well as maceration and partial disintegration of the underlying subdermal fascia. Cazin and Krongold having confirmed Daufresne's findings with the use of a 50 cg. per cent. hypochlorite solution, used a solution containing 15 gm. of Javel water to the liter of water, that is, 0.042 gm. per cent. of sodium hypochlorite, or twelve times less than either Dakin's or Daufresne's solution. They have treated with their solution, at the Messimy hospital, 510 cases of infected wounds, including 155 compound fractures, 286 deep wounds of the soft parts, usually with extensive lesions, 44 amputations made in the fighting zone and suppurating after operation, and 25 cases of severe multiple wounds of the soft parts. Of these 510 patients, only three died, one from tetanus, and one from a severe icterus; two amputations were made because of extension of the lesion, not because of sepsis; 507 patients, all with severe cases, were cured. The 15 per thousand solution of Javel water has a greater bactericidal power than Dakin's solution and is less irritating, the caustic properties of the latter being due to its greater sodium hypochlorite content.

FRENCH BASE HOSPITALS IN RUSSIA

As stated in a previous letter, three military medical-surgical units were sent to Russia to be utilized by our allies in three sections of the country as hospital centers. M. Justin Godart, undersecretary of state for the army medical department, has been informed that after having overcome great difficulties, these units are now in full operation. After three months of methodical preparation, hospitals have been opened in Ourmiah, Tiflis and Kiev. Automobile ambulances have been sent to the front, and are giving very good service under the direction of Medical Inspector Cresson.

A MILK CARD FOR CHILDREN AND THE SICK

Following a conference between the prefect of the Seine and the dairy association, held to provide measures to insure a sufficient milk supply for infants and the sick, it was decided to issue a milk card for their benefit. According to the measures adopted, families having children less than 3 years of age, or sick members who are restricted to a milk diet, will register with some milkman of their choice, and he will give them a special card to be detached from a stub book of cards. This card the recipients must have endorsed by the mayor of their arrondissement after having established their right to such a card. The signature of the physician who gave the medical certificate must be verified by the milk dealer or the mayor. The card issued to the sick is valid for only three months, but may be renewed, if necessary.

ESTABLISHMENT OF A CENTRAL FOOD BUREAU

The food commissioner has established a central bureau or office at which he may be consulted and from which information will be disseminated on the proper methods to be adopted to facilitate the supplying of cooperative municipal organizations or associations and of purveyors of foods of prime necessity. The bureau will combat especially the high prices in large towns, and strive to balance demand and supply. The bureau will supervise the distribution of supplies, both domestic and foreign, according to the needs of the people.

The "Maison d'Amérique" (America Building)

M. Lopez Lomba, the consul general of Uruguay at Paris, recently informed the Geographical Society that certain individuals have agreed to his project for creating a Pan-Atlantic Union, having for its object the founding of a "Maison d'Amérique" in Paris and of "Maisons de France" in the principal cities of the western hemisphere. The "Maison d'Amérique" will be the center for the development of commercial, financial, intellectual and social relations between American countries and between these and western Europe. The scheme includes a general information and propaganda bureau, an industrial exhibit, an American library and museum, a tourist bureau, a society, a journal, an American University, a home for students, a section for welfare work and social defense, courts, lectures, expositions, congresses, etc. M. Lomba is convinced that he will receive the support of interested states and particularly of the Pan-American Union. The meeting adopted a resolution approving this project as outlined.

LONDON LETTER

LONDON, Nov. 13, 1917.

The War

NEW FOOD RATIONS

Sir Arthur Yapp, director of food economy, has announced a new scale of voluntary rations, which are as follows:

	Weekly Ration Lb.	Oz.
Bread:		
Men on heavy industrial work or on agricultural work	8	0
Men on ordinary industrial or other manual work	7	0
Men unoccupied or on sedentary work	4	8
Women on heavy industrial work or on agricultural work	5	0
Women on ordinary industrial work or in domestic service	4	0
Women unoccupied or on sedentary work	3	8
Other Foods (for all adults):		
Cereals other than bread		12
Meat	2	0
Butter, margarin, lard, oils and fats		10
Sugar		8
Children:		
Children to receive "reasonable" rations, no definite scale being laid down.		
The scale laid down by Lord Devonport, the previous food controller, last winter was:		
Bread	4	
(or flour for bread making)	3	
Meat	2	8
Sugar		12*

*Afterward reduced to 8 ounces.

The new scale differs in several respects from the old one. The former food controller confined himself to rationing bread, meat and sugar, whereas Sir Arthur Yapp adds (1) all cereals other than bread, and (2) butter, margarin, lard, oils and fats. While Lord Devonport recognized the wide differences between reasonable food requirements of, say, men employed in hard manual work, men engaged in sedentary occupations, women similarly employed, and children of various ages, his scale was based on a flat rate for each individual, without discrimination as to sex, occupation or age.

The "bread" rations include all flour, whether used for bread or for cooking. Flour may be taken instead of bread at the rate of three-fourths pounds of flour for every pound of bread. The "other cereal" rations include oatmeal, rice, tapioca, sago, barley meal, corn flour, maize meal, dried peas, beans and lentils, and all cereal products except bread and flour. The weight given is the weight of the dry article as bought. If the full bread ration is not used, the amount saved can be taken in other cereals at the rate of three-fourths pounds of cereals for every pound of bread saved. The "meat" rations include the average amount of bone, which may be taken as one quarter of the weight of the actual meat. Any parts of meat (such as rump steak, bacon or suet) which are bought without bone must count for one quarter more than their actual weight. On the other hand, any bone in excess of a quarter of the actual meat bought may be deducted. Poultry and rabbits may be counted at half their actual weight. The meat rations include suet.

A MINISTRY OF HEALTH

Speaking on this subject at the Royal Institute of Public Health, Mr. A. L. Fisher, the minister of education, said that the time now seemed to have come to consider whether all the agencies existing in the country should be combined into a more effective and economical system for promoting public health. A child came into the world under the egis of the Central Midwives Board. A month or two later he received the care, if he received any at all, of a voluntary association, which might or might not be subsidized by the

Board of Education or by the Local Government Board. About the age of 3 the child might proceed to an elementary school, and from 3 to 14 might receive his education there. During that period he was under the medical supervision of the school medical service, which in turn was controlled by the local education authorities and the Board of Education. From 14 to 16 the child did not seem to be under any special public health control. At 16 the child passed under the control of the Insurance Commission. Children who were engaged in manufactures were medically supervised by the Factory Department of the Home Office, unless they happened to be engaged in the manufacture of munitions, in which case they passed under the control of the minister of munitions, if they were not disabled by the war, in which case they were the prey of the Local Pensions Committee. Of course, if the child happened to be mentally defective, he passed under another system of control. If he had the misfortune to be a pauper he became the object of the solicitude of the Poor Law authorities. Thus the child might pass under a very large number of possible public health authorities.

Major Astor also read a paper. He referred to the administrative chaos which resulted from the responsibility for health and welfare being divided between seven central bodies, and many conflicting and overlapping local ones. The first thing required was a central department, and the second was the disentangling and straightening out of the spheres and functions of the 1,800 sanitary authorities of the 630 boards of guardians, of the 238 local insurance committees, of the 318 local education authorities, and of the 320 new pensions committees. Before the war he presided over an informal committee consisting partly of members of Parliament, and partly of practical medical administrators. They investigated alternative schemes of reconstruction. At first they favored the creation of a new ministry, but soon they became convinced that it would be easier, quicker and probably more effective at the start to build on an existing department. The committee next examined the machinery then in existence, and decided that of the various ministries only two needed to be seriously considered as possible nuclei for a health ministry—the Insurance Commission and the Local Government Board. At first the committee inclined to the Insurance Commission as the department on which to build, but was driven to the conclusion that at its inception, at all events, the Local Government Board should be the center to which the services connected with prevention, treatment and inspection should be gradually transferred from the numerous departments now responsible for their provision. If they were to carry out Lord Rhondda's ideal and save 1,000—or even 500—baby lives per week, they must have a health minister, and not three ministers, or even two ministers.

THE PREMIER'S TRIBUTE TO THE ARMY MEDICAL SERVICE

In proposing in Parliament a vote of thanks to the British armies at the conclusion of three years of war, Mr. Lloyd George paid a tribute to the medical service, which he said had never shown greater courage, knowledge and experience. Great consultants had given up princely incomes and volunteered for this service. Wounds had been cured which before the war were regarded as fatal. As an illustration of the services rendered in saving life, he mentioned that in the South African War 50,000 men had died of typhoid. In France, out of our gigantic army, during the whole three years of the war only 3,000 had fallen victims to this disease. The medical profession had suffered. Hundreds had been killed and many more hundreds wounded. Thanks were also due to the women, our trained and untrained nurses, whose tenderness for the wounded had earned thanks from the lips of hundreds of thousands of poor men whose lives had been saved and who had been spared much suffering through their tender ministrations. They had not escaped perils. Many had been killed by shell fire. Many of them had been drowned in hospital ships, sunk with the sign of the cross on them.

In the House of Lords, Earl Curzon proposed a similar motion. He said that when war broke out the Royal Army Medical Corps had 3,168 officers and 16,330 men of other ranks. There were at the present time nearly 14,000 officers and 125,000 of other ranks. The health of the army had been better than that of the civilian population at home. He also mentioned the work of the nurses, not only in the hospitals behind the line, but also in the casualty clearing stations only just behind the front. Seven had been drowned by submarine action, and several others had been killed by enemy bombs on hospitals. The name of one had been rendered immortal by her martyrdom.

Marriages

FRANK WYMAN LAMB, M.D., Akiak, Alaska, physician in charge of the Government Hospital, U. S. Bureau of Education, to Miss Rose May Wynne of Norton, Kan., at Akiak, October 13.

LIEUT. FREDERICK CHRISTOPHER, M. R. C., U. S. Army, Mobile Surgical Unit, to Miss Madeline Smith, both of Chicago, December 1.

GEORGE EDMUND DEARDEN DESAULNIERS, M.D., Montreal, Que., to LUCY JANE O'CONNELL, M.D., of Lewiston, Me., November 23.

ASST. SURG. FREDERICK TALMADGE LAU, U. S. N. R. F., Detroit, to Miss Amy Carleton Leefe of New York City, December 4.

PAUL BUTLER JENKINS, M.D., New York City, to Miss Alma Louise Wells of Binghamton, N. Y., November 19.

WALTER LEE BOSWELL, M.D., Macon, Tenn., to Miss Blarnae La Vleet Crawford of Rossville, Tenn., October 29.

FRANCIS E. DRUMHELLER, M.D., to Miss Ella Kirkpatrick, both of Sunbury, Pa., in Philadelphia, recently.

ALEXANDER EMMETT TURMAN, M.D., to Mrs. Ruby Thomas Storrs, both of Richmond, Va., December 5.

FRANK KINGSLEY DUTTON, M.D., to Miss Huldah Carlson, both of Springfield, Mass., December 1.

FRED MILLER DRENNAN, M.D., Chicago, to Miss Esther Olive Clay of Quincy, Ohio, recently.

Deaths

Oscar M. Leiser, M.D., New York City; College of Physicians and Surgeons in the City of New York, 1896; assistant director of the Bureau of Health of New York; died suddenly, December 11. He was a Fellow of the American Medical Association and of the New York Academy of Medicine. Dr. Leiser was a powerful propagandist against charlatanry and fraud, and had been attached to the bureau since its organization. He had acted as the medical expert of the health department in trials of cases against quacks and medical fakers for several years, and not a case in which he had testified was decided by the courts against the department. Dr. Leiser was hated and feared by all the "patent medicine" fakers, for he was outspoken and fearless in his denunciation of their methods. In his connection with the department of health, which had continued for nearly twenty years, he had served in practically every medical branch of the department. Dr. Leiser was a man of charming personality, able and devoted.

Samuel Parker Cottrell, M.D., Newport, R. I.; Jefferson Medical College, 1882; aged 57; a member of the Rhode Island Medical Society; for several years assistant surgeon in the Massachusetts Women's Hospital, Boston; lecturer in Tufts Medical College, Boston; professor of children's diseases in the St. Paul Medical College, and later chief surgeon of the Boston Emergency Hospital; surgeon of volunteers during the war with Spain; a member of the Newport Board of Health; died in Providence, R. I., December 1.

Charles Willard Howard, M.D., Shoreham, Vt.; University of Vermont, Burlington, 1874; aged 72; formerly a Fellow of the American Medical Association; a member and once vice president of the Vermont State Medical Society, and president of the Addison County Medical Society; for fourteen years superintendent of schools; for three years a member of the county board of education, and since 1881 town clerk; in 1908 representative in the legislature from the town of Shoreham; died at his home, December 1.

William Wayne Owens, M.D., Savannah, Ga.; University of Virginia, Charlottesville, 1885; aged 54; a Fellow of the American Medical Association; a member of the Society of Southern Railway Surgeons; major and surgeon of the First Cavalry, Ga. N. G.; a member of the staff of the Savannah Hospital; a member of the state board of health; local surgeon of the Southern Railway; at one time a member of the city council of Savannah; died suddenly in a store in Savannah, November 23.

David Adams Spear, M.D., Burlington, N. J.; University of Virginia, Charlottesville, 1897; aged 39; a member of the

Medical Society of Virginia, and a specialist on diseases of the eye, ear, nose and throat; who formerly conducted a sanatorium at Albuquerque, N. M.; while driving his automobile over a grade crossing between Burlington and Florence, November 25, was struck by a freight train, and died from his injuries while being conveyed to the Riverside Hospital.

Samuel E. Lewis, M.D., Washington, D. C.; Medical College of Virginia, Richmond, 1864; aged 79; a Fellow of the American Medical Association; first vice president and later president of the Association of Naval Officers of the Army and Navy of the Confederacy; assistant surgeon in the Confederate Service, and in command of the Chimborazo Hospital, Richmond, Va., during the Civil War; from 1868 to 1884 a pharmacist; died in his apartment, November 17.

Samuel S. Boots, M.D., Greenfield, Ind.; Eclectic Medical Institute, Cincinnati, 1870; aged 68; for ten years a member and for two years president of the Indiana State Board of Health, president of the Greenfield Banking Company; for twelve years a member of the faculty of the Indiana Eclectic Medical College, Indianapolis; formerly editor and publisher of the *Indianapolis Medical Investigator* and *Greenfield Herald;* died at his home, November 30, from pneumonia.

Ami Jacques Magnin, M.D., Paris, France; Bellevue Hospital Medical College, 1881; Faculté de Médecine de Paris, 1886; aged 59; formerly secretary of the surgical section of the New York Academy of Medicine; and a member of the staff of the French Hospital, Bellevue Hospital, and Vanderbilt Clinic, New York City; chief surgeon of the American Hospital, Neuilly, near Paris; an officer of the Legion of Honor; died suddenly at his home, November 25.

Zephaniah Kerr Wiley, M.D., Baltimore; College of Physicians and Surgeons, Baltimore, 1875; aged 74; a Confederate veteran; lecturer in anatomy in Baltimore Medical College, and one of the founders; later professor of anatomy, professor of obstetrics and dean of Baltimore University; who was thrown from a street car while making a professional call about a month ago; died from his injuries in the Biedler-Sellman Sanatorium, Baltimore, November 25.

Samuel A. Johnson, M.D., Springfield, Mo.; Kentucky School of Medicine, Louisville, 1889; aged 54; a Fellow of the American Medical Association; superintendent of the Johnson Sanitarium, Springfield; formerly assistant superintendent of State Hospital No. 3, Nevada; was attacked with an axe by an epileptic patient in the yard of the hospital, November 24, sustaining injuries from which he died on the following day.

John Jacob Ott, M.D., Pleasant Valley, Pa.; University of Pennsylvania, Philadelphia, 1874; aged 66; a member of the Medical Society of the State of Pennsylvania; also a pharmacist; vice president and director of the C. and E. Railroad; director of the Quakertown Trust Company; and one of the originators and directors of the Globe Mutual Life Stock Insurance Company; died at his home, November 22.

Albert H. Steinbrecher, M.D., Detroit; Detroit Medical College, 1881; aged 59; a Fellow of the American Medical Association; professor of practice of medicine and clinical medicine in the Detroit College of Medicine and Surgery; a member of the staff of St. Mary's Hospital and the Womans' Hospital and Infant Home, Detroit; died at his home in Arden Park, Detroit, November 25, from heart disease.

Roland C. Shear, M.D., Mount Gilead, Ohio; Starling Medical College, Columbus, Ohio, 1891; aged 50; a member of the Ohio State Medical Association; a specialist in diseases of the eye, ear, nose and throat; for two terms coroner of Morrow County, and later deputy probate judge and probate judge; died in a hospital in Cleveland, November 26, two days after an operation for appendicitis.

John Taylor Jones, M.D., Grass Valley, Calif.; Cooper Medical College, San Francisco, 1898; aged 42; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of California; died at his home, November 19, from spinal injuries sustained in a dive in a swimming tank about ten years before.

Charles Orvis Goulding, M.D., Pittsburgh; Bellevue Hospital Medical College, 1887; aged 58; a Fellow of the American Medical Association, and a charter member of the Pittsburgh Academy of Medicine; associate professor of clinical medicine in the University of Pittsburgh; died at his home, November 27, from pneumonia.

Frederick Page Ransom, M.D., Pittsburgh; Jefferson Medical College, 1904; aged 37; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of Pennsylvania; assistant on the surgical staff of the Allegheny General Hospital; died at his home in Pittsburgh, November 19.

John William Baker, M.D., Granite City, Ill.; St. Louis University, 1911; aged 31; formerly a Fellow of the American Medical Association; a member of the Illinois State Medical Society; while driving his automobile over a grade crossing at Madison, Ill., November 30, was struck by a Wabash passenger train, and died two hours later at St. Elizabeth's Hospital, Granite City.

William Henry Keim, M.D., Philadelphia; Hahnemann Medical College, Philadelphia, 1871; aged 74; president and executive officer of St. Luke's Homeopathic Hospital, Philadelphia; and once president of the State Homeopathic Medical Society; demonstrator of surgery in his alma mater; died at his home, November 23.

Lieut. Sigmund Deutsch, M. R. C., U. S. Army, New York City; College of Physicians and Surgeons in the City of New York, 1892; aged 41; a Fellow of the American Medical Association; visiting physician to the German Hospital and Vanderbilt Clinic; died at his home, November 29, from cerebral hemorrhage.

Edward William Karrmann, M.D., Cheshire, Conn.; New York University, New York City, 1891; aged 65; a Fellow of the American Medical Association; acting assistant surgeon, U. S. Army in 1889; while driving over a grade crossing in Cheshire, November 28, was struck by a trolley car and instantly killed.

Olaf T. Melde, M.D., Spokane, Wash.; Physio-Medical College of Indiana, Indianapolis, 1890; aged 48; formerly a member of the Washington State Medical Association; who had been taking a postgraduate course at the Chicago Eye and Ear Hospital; died suddenly in that institution, November 19, from heart disease.

Capt. Augustin de Yterbide Green, M. R. C., U. S. Army, Prosser, Wash.; Georgetown University, Washington, D. C., 1901; aged 42; a Fellow of the American Medical Association; on duty at Camp Lewis, American Lake, Wash.; died in the cantonment base hospital, Camp Lewis, November 25, from pneumonia.

Frank Loring Sargeant, M.D., Victoria, Texas; College of Physicians and Surgeons, Chicago, 1900; aged 45; formerly a Fellow of the American Medical Association; a member of the State Medical Association of Texas; a specialist on diseases of the eye, ear, nose and throat; died at his home, November 11.

Jules F. Vallé, M.D., St. Louis; Washington University, St. Louis, 1885; aged 58; a Fellow of the American Medical Association; a member of the staff of St. Luke's Hospital; physician to the Missouri School for the Blind, St. Louis; a director of several iron companies; died at his home, November 24.

Rudolph F. Schaefer, M.D., Oklahoma City; Washington University, St. Louis, 1892; aged 51; formerly a member of the Oklahoma State Medical Association, and professor of obstetrics and diseases of women in Epworth College, Oklahoma City; died at his home, November 9, from diabetes.

James Mills, M.D., Janesville, Wis.; Northwestern University Medical School, 1883; aged 65; formerly a Fellow of the American Medical Association; a specialist on diseases of the eye, ear, nose and throat; jumped from a bridge in Janesville, into Rock River, November 18, and was drowned.

Abram Leander Sherick, M.D., Ashland, Ohio; Bellevue Hospital Medical College, 1880; aged 61; formerly a Fellow of the American Medical Association; a member of the Ohio State Medical Association; a specialist in surgery; died at his home, November 18, from disease of the stomach.

Francis Anderson Lyman, M.D., Waimea, Kauai, T. H.; Rush Medical College, 1889; aged 54; a Fellow of the American Medical Association; for nine years superintendent of the Wisconsin State Hospital, Madison; since 1913 a practitioner of Hawaii; died at his home, November 4.

Claire W. Murphy, M.D., Los Angeles; University of California, Los Angeles, 1891; aged 47; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of California; instructor in anatomy in his alma mater; died at his home, November 24.

Jonathan Milton Wyland, M.D., Moline, Ill.; State University of Iowa, Iowa City, 1886; aged 59; president of the Moline Foundry Company, who had been ill for two years with spinal

disease, due to an accident; died at his home, November 29, four weeks after a surgical operation.

Joseph Lorenzo Brunet, M.D., New Orleans; Tulane University, New Orleans, 1898; aged 61; for many years a practitioner of Covington, La., formerly a member of the Louisiana State Medical Association; died at his home, November 19, from heart disease.

Waldo Fitch Sawyer, M.D., Vineland, N. J.; Jefferson Medical College, 1890; aged 52; a member of the Medical Society of New Jersey; once mayor, and for one term coroner of Cumberland County; died at his home, November 17, from pneumonia.

Hans Kudlich, M.D., Hoboken, N. J.; University of Zurich, Switzerland, 1853; aged 94; one of the last survivors of the Revolution of 1848; who retired from practice thirty years ago; died at his home, November 10, from acute bronchitis.

Thomas McKaig Wall, M.D., Osceola, Iowa; College of Physicians and Surgeons, Keokuk, Iowa, 1867; aged 73; formerly a member of the Iowa State Medical Society; a veteran of the Civil War; died at his home, November 18.

Silas Pinckney Holbrook, M.D., East Douglas, Mass.; University of Pennsylvania, Philadelphia, 1862; aged 80; a member and councillor of the Massachusetts Medical Society; died in Farnumsville, Mass., October 2.

Joseph Mark Malatesta, M.D., Philadelphia; Jefferson Medical College, 1886; aged 58; also a graduate in pharmacy; for a time instructor in dermatology in his alma mater; died at his home, November 22, from disease of the kidney.

William T. Griffis, M.D., Fountain City, Ind.; Eclectic Medical Institute, Cincinnati, 1871; aged 70; formerly a member of the Indiana State Medical Association; died at his home, about November 20.

John D. Kaple, M.D., Ogdensburg, N. Y.; Cleveland University of Medicine and Surgery, 1896; formerly a member of the Medical Society of the State of New York; died at his home, November 17.

William Alexander Armstrong, M.D., Philadelphia; Philadelphia University of Medicine and Surgery, 1861; aged 77; died at the home of his son in Philadelphia, November 22, from heart disease.

Albert A. Norris, M.D., Philadelphia; Hahnemann Medical College, Philadelphia, 1887; aged 63; for nineteen years chief clerk at the Philadelphia Mint; died at his home, November 24, from nephritis.

Joseph H. H. Reser, M.D., Conway, Mo.; Ensworth Medical College, St. Joseph, Mo., 1893; aged 67; a member of the Missouri State Medical Association; died at his home, November 8.

William H. Cole, M.D., Kewanee, Ill.; Long Island College Hospital, Brooklyn, 1873; aged 79; a member of the Illinois State Medical Society; died at his home, November 29.

George A. Bachman, M.D., Rochester, N. Y.; New York Homeopathic Medical College, New York City, 1892; aged 49; died at his home, November 21, from heart disease.

Samuel Andrew O'Neal, M.D., Henderson, Ky.; Meharry Medical College, Nashville, Tenn., 1888; aged 55; a colored practitioner; died, November 21, from influenza.

James McQuillen, M.D., Superior, Wis.; McGill University, Montreal, 1874; aged 67; a Fellow of the American Medical Association; died at his home, November 19.

William Robert Yuill, M.D., Yale, Mich.; Bellevue Hospital Medical College, 1877; aged 73; died at his home, November 17, from heart disease.

Daniel Grant Rowley, M.D., Culmerville, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1891; aged 59; died at his home, November 20.

Joseph M. Gerhart, M.D., Philadelphia; Hahnemann Medical College, Philadelphia, 1868; aged 71; died at his home, November 20, from pneumonia.

Howard A. Underwood, M.D., York Springs, Pa.; Hahnemann Medical College, Philadelphia, 1873; aged 74; died at his home, November 17.

Elbridge A. Herriman, M.D., Chicago; Victoria College, Toronto, Ont., 1860; aged 83; died at the home of his son in Chicago, November 28.

Moses Knapp, M.D., Gwynedd, Pa.; Philadelphia College of Medicine and Surgery, 1854; aged 77; died at his home, about November 18.

Thomas Wilson Johnston, Kingston, Mo. (license, Missouri, 1883); aged 84; a practitioner since 1863; died at his home, November 11.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

STRANDGARD'S T. B. MEDICINE

Exploiting the Tuberculous Canadian Soldier

The resident physician of a Canadian sanatorium devoted exclusively to the scientific treatment of tuberculosis writes:

> "The enclosed leaflet and letter from the Dr. Strandgard's Medicine Co. of Toronto, Can., is being sent in a plain envelope, marked 'personal' to a number of returned Canadian officers who are patients in this institution. If you have any information regarding this 'cure' or the company, your Canadian readers would appreciate its publication in THE JOURNAL."

The letter enclosed was on the stationery of the "Dr. Strandgard's Medicine Co." It was addressed to a man suffering from tuberculosis—a man who had been stricken with this disease while in the service of his country. The "patent medicine" concern states in its letter:

> "Our T. B. medicine is a specific for the complaint of which we have been informed you are suffering . . ."

This cruel falsehood is followed up by the statement that the stuff is a "high-class scientific preparation endorsed by physicians" which, previous to being put on the market, was "used with wonderful success in private practice." Further:

> "Dr. Strandgard has been awarded gold medals at four international exhibitions in Europe for his medicines."

Just what was the nature of these exhibitions, we do not know; possibly they were the same sort of international "expositions" that were exposed in THE JOURNAL[1] about three years ago whose "gold medals" meant no more than that the exploiter has paid a specified sum as a guaranty that he would receive an "award." The letter to the consumptive continues:

> "Of course, one bottle will not improve your health owing to the nature of your case, but after three bottles you will derive considerable benefit and will continue to take it until you feel you are restored to normal health. Kindly write us informing us of your permission to forward three bottles. We are agreeable to send them on condition that you do not pay for them unless you are satisfied with the progress you have made . . ."

This appeal is typical of "consumption cure" humbugs. Throughout the entire advertising matter the claim is made by inference that the remedy will cure consumption. None knows better than the trader in a fake consumption cure how easy it is to persuade the consumptive during the first few weeks of any new and mysterious "treatment" that he has been benefited. Time and again it has been shown that such concerns run no risk in offering to send limited amounts of their nostrums to the victims on a basis of "no pay unless satisfied."

The booklet sent by the Strandgard concern states that the preparation was originated by one "Chevalier Dr. Jean F. Strandgard, K. V. V. P." Some prospective purchasers are obtained by offering a free bottle of the nostrum to any one who will furnish "fifteen (15) names and addresses of persons genuinely suffering either from Consumption—Tuberculosis, Asthma, Bronchitis, Catarrh, Weak Lungs, Pleurisy, Pneumonia, Coughs, Colds, or any disease of the respiratory organs." No information is given regarding its composition, although a pretense is made of doing so by stating that it is:

> ". . . from Nature's Garden being made from pure Essences, Infusions, Extracts and healing medicinal virtues of rare barks, roots and herbs."

It contains alcohol—also typical of the fake "consumption cure"—and the usual excuse is offered that this drug is not

1. Reprinted, with addition, in the pamphlet, "Some Quasi-Medical Institutions," published by the American Medical Association; price 10 cents.

present "in any larger quantity than is absolutely necessary" to dissolve one of the alleged constituents. It is to be taken six times a day in two-dram doses. The sixteen ounce bottle thus lasts about ten and one-half days. This means that the three bottles which they offer to send without payment in advance would last the victim about one month. Every physician who has treated consumptives knows that such patients after taking any nostrum—especially one containing alcohol or bitters—for three or four weeks under the glamour of the claims common to quackery, insist that they are "feeling better."

The booklet contains several testimonials; most of them from laymen. Not one of the testimonials declares that the stuff has cured a case of pulmonary tuberculosis or even that it is of value in such cases. Most of them refer to its alleged use in asthma and bronchitis. One is from an alleged sufferer from spinal tuberculosis who claims to have been benefited, although not cured. Two of the testimonials purport to be from medical men—A. H. Paget, M.D., and P. B. Wood, M.D. —both of whom, the booklet claims, are "Members of the College of Physicians and Surgeons of Ontario." While neither of these physicians' testimonials declare that the stuff is a cure or even a treatment for consumption, the evident intent of the booklet is to make the consumptive so believe. Whether the giving of these testimonials indicates a failure to recognize professional responsibility or a mere lack of common sense, we do not know; the solution of such questions may safely be left to the organization to which these men are said to belong.

A fake "consumption cure" is vicious enough under any circumstances. Every physician who has treated consumptives knows how difficult it is to persuade the sufferer that his chance for recovery rests not on medicine but on hygienic and dietetic measures. It is a human failing to believe that every disease may be cured by taking something out of a bottle, and the consumptive is particularly susceptible to the wiles of the "patent medicine" faker. But, if under normal conditions and exploited to civilian consumptives the "consumption cure" business is a cruel deceit, what shall be said of the concerns which seek as victims those men who have acquired tuberculosis in the service of their country? The human carrion that robs the wounded on the field of battle at least takes his life in his hands in so doing; not so the "consumption cure" quack who plies his trade on the invalided soldier.

Anthrax.—This disease, as shown by the Public Health Bulletin of Massachusetts for October, has become increasingly prevalent in the state since the beginning of the war. The cases varied between six and eleven for the years 1908 to and including 1915, when they reached the latter figure. In 1916 the number was thirty-one and for the first nine months of 1917 the number was thirty-nine. The increase has been coincident with the increased shipment of hides from foreign countries whose status with regard to the incidence of anthrax is not well known, the demand for leather having forced manufacturers to seek new sources of supply. In 1917, six of the thirty-nine reported cases were fatal. There was one case of pulmonary anthrax; the remainder were external The pulmonary case and thirty-four of the others resulted from the handling of hides, three from the handling of hair and one from handling wool. Accurate diagnosis depends on the bacterial findings. It is said that English investigators have reported cases of anthrax simulating cerebrospinal meningitis, the diagnosis not being established until the anthrax bacilli were demonstrated in the spinal fluid. The United States Bureau of Animal Industry recommends for the prevention of infection that hides be immersed for not less than forty-eight hours in a 1:1,000 solution of mercuric chlorid, or for a like period in a 10 per cent. salt solution containing not less than 2 per cent. of hydrochloric acid. The British Local Government Board directs that in the steam disinfection of hair, cases or bales should be opened and the bundles removed and most of the strings cut unless the temperature inside the steam apparatus is maintained at 230 F. for half an hour.

Correspondence

THE CARREL-DAKIN TREATMENT

A Reply to Dr. Bevan by Dr. Joseph C. Bloodgood

To the Editor:—I cannot agree with my friend and colleague, Dr. Arthur Dean Bevan, but I am rather inclined to the view that his open letter to Dr. Welch (THE JOURNAL, Nov. 17, 1917, p. 1727) will do good. A fair controversy leads to the crystallization of the opposing opinions, and often hastens the proper solution of the problem.

I cannot agree with Dr. Bevan that Carrel's method is against the views of surgical pathology and wound repair. I confess, I am somewhat confused myself as to what the real surgical pathology of wound repair is.

Bevan speaks of surgical pathology resting on the work of such men as Lister, Paget, Billroth, Fenger and Senn. Senn's chief work was in the surgical pathology of tumors, and his experimental work chiefly in intestinal suture, fracture of the neck of the femur, and pancreatitis. Fenger's pathologic work began at the necropsy table and continued as that of an operating surgeon interested in the pathology of the diseases that he attempted to cure by operation. Neither was particularly interested in wound repair and wound infection, and, as most of us today, had little or no experience with wounds of the character seen in this war. Billroth, perhaps the greatest of all surgical pathologists, missed a great opportunity in his military experience to establish the noninterference methods in the old type of perforating bullet wound.

As I read Lister, I am impressed with the conclusion that his observations and results very strongly suggest the great value of an antiseptic. In all of Lister's experience he was never confronted with wound problems such as confront us in this war. Schede's work on blood clot in osteomyelitis is evidence that an antiseptic can sterilize a wound. In conversation, Dr. Halsted, professor of surgery at Johns Hopkins University, fully agreed with me as to the statements I am now making. I know of no surgeon of his time in America who has devoted more attention to the problems of wound healing and the treatment of infected wounds than has Halsted. His early contributions to the treatment of joint infections prove this. Halsted looks on Carrel's work as most scientific and as the greatest contribution to wound treatment in this war.

Dr. Bevan is of the opinion that it was a serious mistake for the government Medical Service to adopt the Carrel treatment and to force "a complicated, time-consuming, expensive plan" on our Medical Service. I cannot agree with Dr. Bevan. In the first place, I do not know that the Surgeon-General has "adopted" the Carrel method. After rereading Carrel's book a number of times, with frequent visits to his experimental hospital in New York, and after using his method, I am of the opinion that the Surgeon-General has given the surgeons of this country the best opportunity as yet ever offered them for the study of wound repair and wound treatment by ordering officers of the Medical Corps to take a course of instruction in the Rockefeller War Hospital; the courses given in Philadelphia will also be of inestimable value.

As Piper of Philadelphia said after his experience in the hospitals in France: *war* surgery is *ward* surgery.

In peace surgery the chief work of the operator and his assistants consists of the preliminary examination of the patient and the skilled surgical technic and anesthesia during operation. There are few open and infected wounds to treat, and as a rule the senior surgeon pays little attention to them, and the junior surgeons have much to learn.

In industries there has been a tremendous improvement in the surgical departments, and with this the same improvement in the healing of the wounds. Industrial surgeons of experience, such as Sherman of Pittsburgh and Noland of Birmingham, express the opinion that the Carrel method has led to improvements in their results.

I cannot agree with Dr. Bevan that *one morning* spent at the Carrel Institute gives sufficient opportunity to judge the value of the method, and I see no impropriety for Dr. Hart-

well to consult during the operation with a French army officer as to some of the details in starting the Carrel method.

Nor can I agree with Dr. Bevan in regard to his conclusion on Carrel's book. Carrel had an excellent team, and attacked the problem in a most scientific and broad way. He employed controls.

When Carrel started his investigation, the majority of military surgeons were by no means satisfied with any of their methods, or with their results. The excision of the wound in the stage of contamination, or the thorough cleansing of the wound in the stage of infection and its wide opening were methods already employed when Carrel started. His contributions to the open wound treatment are: a most effective instillation tube; the adjustment of the tube or tubes so that every portion of the surface of the wound in every nook and corner is continuously bathed in an antiseptic solution that is most potent in its effect on the bacteria and least injurious to the granulation tissue and to the power of the cells and fluid against the bacteria themselves. Carrel, apparently, was the first to prove with bacteriologic control that an open wound could be practically sterilized and then closed.

In the huge wounds of this war, there seems no question that the sooner they are closed the better. The opponents of the Carrel method do not question the scientific precision of his technic, or his results; they claim, however, that his technic can be followed out successfully only in a stationary hospital with a large personnel, and that it is expensive in time and material. In addition, they claim that the technic is difficult; that his solution requires an expert to prepare it, and that it must be guarded, or its effective strength may be lost.

Carrel's method and results have been the chief stimulants to investigation by others for a method that will be equally good, but simpler and less expensive. The investigators who are advocating dichloramin-T take this ground.

In reading the contributions and studying the motion pictures presented by Captain Furnes and Lieutenant Lee, one is impressed by the fact that their investigation has led to a marvelous improvement in the technic of treating the ordinary accidental or industrial wound; and they have accomplished this with economy of time and material. But up to the present time I am unable to agree with them that the methods with dichloramin-T accomplish the same result in the huge open wounds which often contain necrotic tissue, and it is chiefly for this group of wounds that Carrel developed his technic.

I am not claiming that Carrel's method will be the ultimate solution of the problem, but I do claim that up to the present time it is the one great contribution to wound treatment, and that the ultimate treatment will be due to, and based on, Carrel's clinical and scientific research; and every surgeon who expects to treat wounds in this war should have special training in all the laboratory and clinical details of the Carrel method.

Joseph Colt Bloodgood, M.D., Baltimore.

A Reply by Dr. A. T. McCormack

To the Editor:—In The Journal, Nov. 17, 1917, appears a letter by Dr. Arthur Dean Bevan in regard to the Carrel-Dakin treatment. This letter is based on such a complete misconception of Dr. Carrel's work and motives, and is so untimely and ill considered that one who does not know and admire Dr. Bevan, as I do, might wonder whence the source of his inspiration in attempting, in an academic discussion, to throw confusion into the Medical Department of our Army in regard to such an important scientific question. I respectfully submit that no man, however distinguished himself, is the final judge on scientific matters, and that especially if he be in a position of great responsibility, conferred upon him by the profession, he has no right to give publicity to a personal letter which lends the weight of his authority to a destructive criticism without a semblance of investigation or knowledge of a conscientious scientific investigator and his associates, and a method of management of infected war wounds, which, in the hands of those skilled in its application, has demonstrated its value. His misconception of Dr. Carrel's technic and purposes is the only thing made plain in this letter.

In all the real scientific principles involved, wherein Dr. Bevan correctly interprets the findings of scientific clinical surgeons the world over, his conclusions had already been as well stated by Dr. Carrel in recording the results of his investigations.

Over and over again, Dr. Carrel emphasizes and reemphasizes the problems of surgical pathology, and exhibits a profound critical, scientific knowledge of them. Over and over again, he states that Dakin's solution and the Carrel technic are modifications in method, and in no way change the principles underlying modern surgery. Over and over again, he states that some other antiseptic applied by another modification of technic may eventually be found more practical than the one which bears his name; but he insists, and so will every one who really knows his work and who is interested in a proper conclusion of this matter, that whatever the technic, whatever the antiseptic proposed, its value shall be judged by exact, modern, scientific methods and not by the *ipse dixit* of some scientific clinical surgeon or surgeons, simply because he or they are willing, without a claim to personal knowledge or a pretense of scientific investigation, in the emergency of a great war where so much is at stake, to base the condemnation of a scientific method on a mere analysis of a little *précis* or manual which plainly states that its chief purpose is to refresh the memory of those who have participated in the course of study of the treatment under one who has had it demonstrated to him until he has mastered it.

If one were so unjust to Dr. Bevan as to characterize this publication of a personal letter based, as he says, on letters from Joe this, and Fred that, and one operation done by Josh somebody else, and the hurried and superficial reading of a book whose whole purpose and character he so evidently misconceives, he would not do justice to so charming a man.

The Carrel-Dakin treatment is not advanced as a miracle or cure-all, nor is it expected that it will take the place of all other methods in the treatment of wounds and injuries. It is above all not expected that it shall be utilized by that class of scientific clinical surgeons who base their opinions on the internal evidence of books, rather than on knowledge of and experience in a method that can be seen with the eyes of the trained observer and correctly verified with the microscope and in the chemical laboratory. Boric acid, aluminum acetate, Dakin's solution, Labarraque's solution, brilliant green, iodin, phenol, chloramin-T and dichloramin-T, hydrogen peroxid, normal salt solution, sterile water, mercuric chlorid and many other antiseptics, of varying dilutions and value, have been so thoroughly tried out and the results of their applications so fully charted, by exactly the same painstaking methods, and by a scientific staff and allied investigators, that the surprise of his life awaits any scientific clinical surgeon who bases his confidence in the future of surgical development on the history of the science, rather than on the scientific practice of the art.

All surgeons agree that the vast majority of war wounds are infected. This fact has been proved in every war hospital in Europe, and, before that, was known to every man who has rightly read the history of war. After the mechanical cleansing, which is entirely surgical, based on the well known principles of surgical pathology and which Dr. Carrel would evaluate not at 90 per cent., but as the *sine qua non* of success with any method of antiseptic treatment of wounds, he insists that the next step is sterilization of the wound. This does not mean *apparent* sterilization, but *surgical* sterilization under bacteriologic control. Each day or two days, smears are made from various parts of the wound, and the bacteria present are stained and counted. If streptococci, staphylococci and bacilli are absent, one must find not more than one other microbe to five or ten fields before the wound is surgically sterile. If this degree of sterility is secured before the twelfth day, there is rarely cicatricial tissue about its edges, the skin is not adherent, and the wound may be closed with adhesive plaster or sutures, as is most desirable. After the twelfth day, it is necessary to dissect away the cicatrices about the edge of the wound, and it is the better practice only to insert the sutures, continuing the application of the antiseptic for a few days, to be sure that sterility is maintained before they are tied. Sur-

gical pathology would, of course, dictate that in the presence of edema there would be no wound closure.

Dr. Carrel states that the conditions requisite for action of any antiseptic are contact, proper concentration of solution and a sufficient time. He states it so frequently that the most superficial observer should know that he believes he has proved that the wound must be so prepared by the practical application of the principles of modern scientific surgical pathology that the antiseptic being tested must come in contact with the tissue itself, and that all necrotic tissues and foreign bodies must have been removed and hemostasis be perfect.

In the Carrel technic, the Dakin solution is brought into contact with all parts of the wound through the insertion of rubber tubes of certain dimensions, having perforations of exact sizes at certain intervals, so that the desired concentration of solution will reach every part of the wound every two hours. This contact of the antiseptic in this exact concentration of solution shall be continued for the time necessary to bring about asepsis. Dr. Carrel states, always, that this is no new treatment. It is well known that Chattanay discovered the action of chloramins long ago, but the *systematization is, however, new,* and it is perfectly evident to the most casual reader that it is as new to many of our most distinguished scientific clinical surgeons as to the thousands of wounded soldiers who have been restored to the front by its application, where other methods left them languishing in the hospitals or resulted in loss of limbs or life.

But Dr. Carrel has gone much farther in his search for a definite means of expressing the value of an antiseptic. He has found from extensive study of the actual wounds themselves, working with others to whom he gives most of the credit, that there are definite laws of cicatrization. A surgically sterile wound, carefully measured, and its area determined by a planimeter, at four day intervals, will cicatrize at a rate which is capable of expression in a mathematical curve, and may be demonstrated by a mathematical formula. Practically, each surgically sterile wound is measured, its area plotted, and this is repeated and recorded every four days. With these and certain other factors known, the normal curve of cicatrization of that particular wound is calculated. Afterward, repeated measurements at four day intervals show how much the treatment applied by the surgeon *delays* cicatrization. Dr. Carrel states definitely and repeatedly that *no known treatment hastens cicatrization,* but that surgical sterilty is an essential prerequisite to the normal rate of cicatrization.

This method of mathematical control of cicatrization is applied not only to wounds in general but to each particular wound, so that the scientific surgeon, properly advised by a practical bacteriologist, is able to know when normal cicatrization has been delayed either by the *laissez faire* policy of some scientific clinical surgeon leaving behind necrotic tissues to be cared for or foreign bodies to become encapsulated or by any other condition demanding surgical interference.

I am not attempting to give any further details than are necessary to show that the Carrel-Dakin method of treatment of war wounds is based on scientific data, against which the fiat of any one cannot and should not prevail. Repeated contact with Dr. Carrel leads us to recognize in him a degree of scientific precision and personal modesty that would prevent his replying in kind to such a letter.

Exactly such a misconstruction of Lister's work as is attempted in the Bevan letter has ever since kept many surgeons from getting the benefit from antiseptics that Lister did, while other practical men, refusing to be misled, have continued to secure Lister's results by the real application of Lister's methods, disregarding his necessarily faulty lines of reasoning in regard to them.

Dr. Bevan, by this attack without study or practical knowledge of his subject, is but repeating history. Semmelweis, Jenner, McDowell, Crawford Long—every man who has advanced the practical art of medicine, has had some one of the priests-of-the-vested right-in-knowledge to condemn him and his methods and results in unmeasured terms, and our profession has rarely recognized during their lifetime its best promoters except by the contumely and condemnation of the self-righteous.

It is important for the profession to understand that its final verdict on Dr. Carrel's definite method of the treatment of infected war wounds by the use of Dakin's solution is likely to be more influenced by erroneous comment from three sources than by the merits or demerits of the method itself. These are likely to come, first, from those who condemn academically without either investigation or knowledge; secondly, from those who accept the suggested treatment because it is novel and new without knowledge or investigation, and who, without understanding the reason, change or modify the technic so that it becomes wholly inadequate; and, thirdly, from those who honestly think they have investigated the Carrel-Dakin technic when really they have studied the work of some one of the second class. It is a serious question whether such a method, requiring what seems to one first seeing it a somewhat complicated technic is not more in danger of being misjudged from the statements of its ill advised and frequently overenthusiastic advocates, than of its ill informed and reactionary opponents.

ARTHUR T. MCCORMACK, M.D., Bowling Green, Ky.

FUND FOR BELGIAN AND FRENCH PHYSICIANS

To the Editor:—In order to further the subscriptions to the fund being collected by Dr. W. W. Keen of Philadelphia for transmission to our Belgian and French colleagues to help them in reestablishing themselves in their homes and offices, I should be very glad if you could find space for the enclosed letter from Dr. Triboulet of Paris. Dr. Triboulet is a distinguished physician of the Hôpital Trousseau, and was in this country at the time of the International Congress on Tuberculosis in 1908.

HENRY BARTON JACOBS, M.D., Baltimore.

Dear Dr. Barton Jacobs:—After three years of the most frightful cataclysm, France is always up. She has saved herself and the civilized world; at which cost you may think of it by the narrations you may read; they are nothing compared with the reality. Some of the oldest and richest provinces (in soil, industry, and art) are now a desert. Today, tomorrow and days after tomorrow we must use all our energy and money in building again and in helping those who are in awful distress. Among the latter are the medical faculties, and I hesitate no more to send you and the U. S. confrères the most earnest appeal. If indiscretion is not too great, will you allow me to ask you to be an intermediary for this international medical problem: to give our spoiled confrères the necessary means to come back and live in their devastated homes. The French medical associations will collect nearly a million francs by corporations, private funds. In our northern invaded departments (Oise, Somme, Pas de Calais, Aisne, Nord, Marne, Ardennes, Meuse et Meurthe et Moselle), there are 2,000 doctors. From these 2,000 confrères, *1,000,* at least, will want material help to begin again their professional life, and we think five thousand francs—5,000 Fs.—the necessary sum of money for each one. The million we possess is every day lessened by the necessity of immediate help to the expelled medical families, when repatriated day after day, or week after week.

I hesitated a long while before writing this: U. S. A. did do, and will do so much for France, that one is quite ashamed to ask again. But proudness is unreasonable in such questions, and I make myself very humble for the sake of the confraternal misfortunes. A sort of incitement came a few days ago when the Uruguay confrères sent us spontaneously 35,000 francs in a cheque.

My family gave three "poilus" to dear France; one, aviator, one artillery officer; both wounded and cured, and started again; the third in Engineers Corps, a young 18½ fellow.

Magnin's son is a brave little one; he is in the Saloniki Army in the medical staff. French, and I am sure U. S. youth is full with ardor and confidence. "On les aura" is the common expression. Don't judge our people in books or in newspapers; one must see him at work; that is splendid. In a near future, you will come and see that, and you will find here an old man very, very happy to see you at the well deserved peace-hour. Long live the sister republics!

HENRI TRIBOULET,
25, Avenue d'Antin, Paris.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALABAMA: Montgomery, Jan. 8. Chairman, Dr. S. W. Welch, Montgomery.

COLORADO: Denver, Jan. 8. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

DISTRICT OF COLUMBIA: Washington, Jan. 8. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington.

HAWAII: Honolulu, Jan. 10-13. Sec., Dr. G. A. Batten, Box 375, Honolulu.

INDIANA: Indianapolis, Jan. 8-10. Sec., Dr. Wm. T. Gott, 84 State House, Indianapolis.

MINNESOTA: St. Paul, Jan. 2-4. Sec., Dr. Thomas McDavitt, 741 Lowry Bldg., St. Paul.

MISSOURI: St. Louis, Dec. 17-19. Sec., Dr. George H. Jones, 206 Washington St., Jefferson City.

NATIONAL BOARD OF MEDICAL EXAMINERS: New York City, Jan. 9-17. Sec., Dr. J. S. Rodman, 310 Real Estate Bldg., Broad and Chestnut Sts., Philadelphia.

NEW MEXICO: Sante Fe, Jan. 14. Sec., Dr. R. K. McClanahan, East Las Vegas.

NEW YORK: Albany, Buffalo, New York City and Syracuse, Jan. 29-Feb. 1. Sec., Dr. W. J. Denno, Education Bldg., Albany.

NORTH DAKOTA: Grand Forks, Jan. 1. Sec., Dr. G. M. Williamson, Grand Forks.

OKLAHOMA: Oklahoma City, Jan. 8-9. Sec., Dr. J. J. Williams, Weatherford.

OREGON: Portland, Jan. 1. Sec., Dr. Herbert S. Nichols, Portland.

PENNSYLVANIA: Philadelphia, Jan. 8-10. Sec., Nathan C. Schaeffer, State Capitol, Harrisburg.

RHODE ISLAND: Providence, Jan. 3. Sec., Dr. B. U. Richards, State House, Providence.

SOUTH DAKOTA: Pierre, Jan. 8. Sec., Dr. P. B. Jenkins, Waubay.

UTAH: Salt Lake City, Jan. 7-8. Cor. Sec., Dr. G. F. Harding, 407 Templeton Bldg., Salt Lake City.

WASHINGTON: Spokane, Jan. 1. Sec., Dr. C. N. Suttner, Baker Bldg., Walla Walla.

WISCONSIN: Madison, Jan. 14. Sec., Dr. J. M. Dodd, 220 E. Second St., Ashland.

Connecticut July Examination

Dr. Edwin C. M. Hall, secretary of the Connecticut Homeopathic Medical Examining Board, reports the written examination held at New Haven, July 10, 1917. The examination covered 7 subjects and included 70 questions. An average of 75 per cent. was required to pass. Four candidates were examined, all of whom passed. Two candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
New York Homeopathic Medical College and Flower Hospital	87.2; (1917) 76.5, 80.1, 83.4.	(1916)	

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Boston University		(1912)	Mass.
New York Homeopathic Medical College and Hospital		(1904)	New York

West Virginia July Examination

Dr. S. L. Jepson, health commissioner of the West Virginia Public Health Council, reports the oral, practical and written examination held at Charleston, July 10, 1917. The examination covered 10 subjects and included 100 questions. An average of 80 per cent. was required to pass. Of the 38 candidates examined, 31, including 3 osteopaths, passed, and 7 failed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Georgetown University		(1910)	80.2
Chicago College of Medicine and Surgery		(1917)	89.3
Loyola University	(1915) 85.8; (1916) 81.9, 82.5, 83.9, 86.5, 86.8, 87.2, 88.5.		86.6
Kentucky School of Medicine		(1898)	84.8
University of Louisville	(1913) 85.8; (1917)		88.8
Maryland Medical College		(1904)	89.2
University of Maryland	(1917) 80.3, 81.5, 81.7, 83, 84.9, 89.4.		
Eclectic Medical College		(1917)	90.6
Ohio State University		(1917)	89.8, 91.5
Medical College of Virginia	(1915) 81.5; (1916) 82.1; (1917)		81.3
McGill University		(1917)	84.8

College	FAILED	Year Grad.	Per Cent.
Chicago College of Medicine and Surgery		(1917)	76.9
Loyola University		(1916)	77.3
University of Louisville		(1909)	77.4
Maryland Medical College		(1911)	77.1
University of Maryland		(1917)	76.8, 84.3*
Medical College of Virginia		(1917)	73.4

* The board reports that although this candida e passed the examination creditably, he was refused a license because of evidence that he had been illegally practicing in the state for twelve months, and because of his moral character.

Book Notices

THE ELEMENTS OF THE SCIENCE OF NUTRITION. By Graham Lusk, Ph.D., Sc.D., F.R.S., Professor of Physiology at Cornell University Medical College, New York City. Third Edition. Cloth. Price, $4.50 net. Pp. 640, with 28 illustrations. Philadelphia: W. B. Saunders Company, 1917.

Lusk was a pupil of Voit and the Munich school of metabolism. He returned to America with the spirit and principles of thought which made that school great, continuing here to perform productive experimental work. He has trained a corps of younger men along similar lines, and by this book has greatly helped the spread throughout the country of a sound knowledge of the elements of the science of nutrition. The issue of the present war will depend in a large degree on the ability of nations to solve problems of alimentation, to apply and develop further such facts and principles as form the subject matter of this book. It is fortunate that we have a body of men trained in these lines to apply and teach the facts of metabolism and discover new ones as needs arise. The fact that we have them has been due in no small measure to the influence of this author and this book. The value of the latest edition is increased especially by its authoritative presentation of much newer data won by E. F. Du Bois, J. R. Murlin and other men more or less directly affiliated with the writer. At the present time, perhaps, interest will center in the chapter on a normal diet, the new chapter on food economics, with special reference to the war, the chapter touching the nutritive value of various materials used as foods, that on food requirements during the period of growth, and on the revised food tables. The sections dealing with the metabolism taken as a whole, particularly as revealed by the respiration calorimeter, show, as in previous editions, the hand of the master. They outshine in excellence those parts of the book that deal with the mechanisms of chemical reactions within the body.

In the preface the author states that he has no intention of again revising this book, because in another decade the development of scientific knowledge will probably permit the formulation of the subject from the standpoint of physical chemistry. It is to be hoped that progress may be sufficiently rapid to fulfil this interesting forecast. In the meantime the present volume must be regarded as a notable achievement which should be made available in every laboratory, diet kitchen and home in this country.

THE PRINCIPLES OF ACIDOSIS AND CLINICAL METHODS FOR ITS STUDY. By Andrew Watson Sellards, Associate in Harvard Medical School, Department of Tropical Medicine. Cloth. Price, $1. Pp. 117, with 1 illustration. Cambridge: Harvard University Press, 1917.

Under normal conditions, the ingestion of 5 grams of sodium bicarbonate is followed promptly by a change in the reaction of the urine from acid to alkaline as tested by litmus. In the nephritis of Asiatic cholera and in certain other forms of nephritis not due to cholera, Sellards has noted an increase of the tolerance for bicarbonate, that is to say, massive doses of this salt may be required to make the urine alkaline to litmus. He interprets this phenomenon as due to nephritic acidosis rather than to nonexcretion of the base; and, departing from these experiments, Sellards advocates determining the tolerance of the body for sodium bicarbonate as the most delicate and practical clinical method of diagnosing acidosis. One may thus detect deficiencies of from 20 to 30 gm. in the bicarbonate reserve of the body. The author claims priority over Henderson and Palmer in the use of this method.

The book has an introductory chapter on the development of the modern conception of acidosis, and some elementary facts concerning acids and bases. A current view of the mechanism by which the reaction of the blood is kept constant and by which the body maintains its equilibrium of acids and bases is briefly stated. There is a definition of acidosis in agreement with L. J. Henderson, D. D. Van Slyke and others, and of the principles underlying its clinical diagnosis, together with the pros and cons of several methods of estimating acidosis. The writer strongly endorses an appropriate use of alkali in the treatment of certain acute types of nephritis, thus recalling the views of M. H. Fischer,

although Sellards denounces the use of hypertonic sodium chlorid.

A bibliography contains references to seventy-one contributions on the subject of acidosis prior to 1917. The book serves the purpose of bringing together in convenient form what every physician should know about acidosis. It is marred slightly by its use of an obsolete chemical nomenclature, such as oxy in place of hydroxy butyric acid.

THE SENSE OF SIGHT. By Frank Nicholas Spindler, Professor of Psychology and Education, State Normal School, Stevens Point, Wis. Cloth. Price, $1.25 net. Pp. 156, with 25 illustrations. New York: Moffat, Yard & Co., 1917.

In endeavoring to convey what the sense of sight means to us, the author has given a sketchy description of the anatomy, physiology and physics of the eye; of the predominant influence of vision in the acquisition of knowledge of external things, and of its part in the development of mentality and the emotions. He says, and has attempted to show by experiments made according to a method which he lays down, that about 60 per cent. of persons are visual minded as distinguished from auditory or motor minded; that is, they acquire knowledge by seeing things or reading about them rather than by hearing or doing them. This is not wholly a desirable state of affairs, but is fostered by modern modes and habits of life and the constant flood of newspapers, magazines and books, which every one reads for himself, thus permitting to fall into disuse the arts of listening, of conversation, of writing, and, be it said, of thinking. He makes a plea for the extension of coordinate education of eye and ear and hand, as taught by Pestalozzi, Froebel and Montessori. The visual type of mind is quicker to learn, but is apt to be more superficial. Few noted scientists or scholars are of the visual type; but artists, architects and designers are apt to be. It is highly desirable to cultivate the acquisition of knowledge through the sense of sight and to take proper care of its organ, but it is important also to develop all the other senses, to give a rounded, complete intellectual background for what the eye visualizes.

Medicolegal

Privileged Knowledge and Roentgenograms—Right to Select Physicians

(Stapleton vs. Chicago B. & Q. R. Co. (Neb.), 162 N. W. R. 644)

The Supreme Court of Nebraska holds, in this personal injury case, that when a party submits to an examination, or inspection, by a physician, for the purpose of learning the state of his health or the physical condition of any part of his anatomy, the knowledge thus acquired by the physician is privileged, and, under Section 7898 of the Revised Statutes of Nebraska of 1913, the physician is not permitted to testify to the condition he found, over objection based on the statute. And when a plaintiff has permitted a physician to make a roentgenogram of his injured foot for the purpose of ascertaining the extent and character of his injuries, the roentgenogram so made is not admissible in evidence over objection of the plaintiff based on the statute.

The court says that the statute cannot be given a strained construction, but must be taken in its plain and ordinary sense. When it says that a physician shall not be allowed to give testimony or to disclose confidential communications properly intrusted to him in his professional capacity, and necessary and proper to enable him to discharge the functions of his office, it means to exclude the disclosure of any information that comes to such physician by reason of the professional capacity in which he acts. It does not matter whether the patient seeks a prescription for a disordered stomach or a roentgenogram of an injured foot. Nor does the statute make any distinction between a regularly retained physician of a railroad company, who is paid for his services by the railroad company, and a physician paid by the patient. And the same rule which would exclude the oral testimony of the physician would exclude the roentgenogram of the plaintiff's foot. Its introduction in evidence would be a disclosure of a confidential communication.

The defendant complained because on cross-examination it was not permitted to inquire whether the plaintiff had submitted himself for examination to specialists for the purpose of qualifying them as witnesses, and that he did not intend to produce these witnesses on the trial. This line of examination was not pertinent to anything developed in the examination in chief of the witness. He had the right to select his own physicians and his own witnesses. If counsel for the defendant disbelieved the testimony of the physician who testified as to the character and extent of the plaintiff's injuries, he might have procured the testimony of men eminent as physicians and surgeons by application to the court for the appointment of a commission to make an examination of the person of the plaintiff.

Authority to Treat Employee Beyond Thirty-Day Period

(In re Carpenter's Estate (Mich.), 162 N. W. R. 963)

The Appellate Court of Indiana, Division No. 1, says that the industrial board of the state certified to it the question of law as to whether a physician who treated an injured employee eighty-seven days from the date of the injury was entitled to have his claim for $171 for the last fifty-seven days' treatment approved as against the employer, under substantially the following statement of facts: The employee by an accident arising out of and in the course of his employment sustained severe third degree burns over his face, head, chest and hands. His employer had actual personal knowledge of the injury at the time it occurred, and employed the physician to treat the injuries, saying to him: "Take this man to the hospital, give him close attention, and do the best you can for him." The employer did not, at that time, or at any other time, expressly say to the physician that he should discontinue his treatment at the expiration of the first thirty days from the date of the injury, or that he should continue his treatment after the expiration of thirty days, but on frequent occasions, both before and after the expiration of the thirty days, inquired of the physician as to the condition of the employee and what progress he was making toward recovery. At the expiration of thirty days, the condition of the employee was such as to make continued treatment absolutely necessary. As a result of the treatment, the employee recovered with practically no scar tissue and without serious disfigurement. The employer admitted that the physician's bill of $171 for the treatment for the last fifty-seven days was reasonable and a proper charge under Section 26 of the Indiana workmen's compensation act, but he denied liability therefor.

The court thinks that the language used by the employer immediately following the injury, in directing the physician to treat the injured employee, standing alone, would warrant the inference that the treatment should continue so long as necessary to effect a cure or give the injured person every possible chance to be cured. Such statements of the employer, considered in connection with the character of the injury, the employer's knowledge thereof, and of the continued treatment by the physician beyond the thirty-day period, and his apparent solicitude about the treatment and the patient, were at least sufficient to warrant the proper tribunal in inferring the fact that the employer duly authorized the physician to continue the treatment for the full period for which he asked an allowance.

However, unless this court can say that the foregoing is the only inference that may reasonably be drawn from the facts stated, it is not warranted in going further than to decide as a question of law that such inference may or may not reasonably be drawn from the facts as stated. The determination of questions of fact by the board is conclusive, and in view of this rule the court deems it proper to leave the finding of the ultimate fact to the board, with the further statement that if, in the judgment of the board, the services of the physician beyond the first thirty-day period were authorized by the employer, the question of law propounded by the board should be and is answered in the affirmative; otherwise, in the negative.

Society Proceedings

American Association of Anatomists, Minneapolis, Dec. 27-29.
American Physiological Society, Minneapolis, Dec. 27-29.
Porto Rico Medical Association, San Juan, Dec. 22-23.
Society of American Bacteriologists, Washington, D. C., Dec. 27-29.
Western Surgical Association, Omaha, Dec. 14-15.

SOUTHERN MEDICAL ASSOCIATION

Eleventh Annual Meeting, held at Memphis, Tenn., Nov. 12-15, 1917

The President, DR. DUNCAN EVE, Nashville, in the Chair

Tumors of the Urinary Bladder

DRS. EDWARD S. JUDD and S. W. HARRINGTON, Rochester, Minn.: From a therapeutic standpoint, bladder tumors may be classified as those satisfactorily treated by endovesical methods and those requiring open operations. The benign papilloma will usually respond to fulguration. Multiple papillomas, or individuals not tolerant to this kind of treatment, are better treated by open operation. All our bladder tumor cases are examined cystoscopically at definite intervals following operation to detect a recurrence. In the past few years we have found fourteen recurrences that were amenable to fulguration. In case the benign tumor does not respond readily to fulguration, it should be removed by an operation. They may be malignant. All definitely malignant papillomas, either of the papillary type of carcinoma or of the type infiltrating the bladder wall, are best treated by open operation at once. All large benign tumors, such as myomas, fibromas and angiomas, should be removed by suprapubic operation.

The operative procedure for tumor of the bladder consists of excision of the tumor and resection of the portion of bladder wall from which the tumor arises. A simple excision of the tumor is permissible only in the case of a papillary tumor on a pedicle. Even with this form of tumor, it is better to excise a portion of the adjoining bladder tissue. This means invasion of the prevesical space; but with modern technic, it adds little, if anything, to the operative risk. If the resection is not extensive, the remaining opening can be closed, and drainage established through the bladder. If a large segment of bladder is removed, it is better to drain the space for several days. The drain can be brought out through the bladder or along the side of the bladder. If the prevesical tissues are exposed, drainage is essential.

Hypertrophic Pyloric Stenosis in Infancy

DR. WILLIAM D. HAGGARD, Nashville, Tenn.: Pyloric stenosis presents a picture so characteristic and clear cut that diagnosis should not fail. The symptoms may appear within a few days of birth, or be delayed until the second and rarely the third month. Vomiting is the first symptom usually noted. A previously healthy, normal, usually robust, breast fed boy begins to vomit abruptly in the third or fourth week without apparent cause. To the persistent, explosive, forcible vomiting are added symptoms of faulty nutrition, constipation, oliguria and steady loss of weight. Visible gastric peristalsis is a constant symptom. The wave passes from left to right, and may be elicited after food has been taken. Palpation a little to the right and above the umbilicus often reveals a tumor about the size and shape of a small green olive. The tumor is most distinct in the more severe cases, in patients with thin, retracted abdominal walls. It is variable in its position, and may be out of reach under the liver. If every patient with hypertrophic pyloric stenosis was operated on as soon as the diagnosis is made, the mortality might be reduced 10 or 15 per cent. Failure to seek prompt surgical relief is too often fatal. Even though the baby may apparently be holding its own under medical treatment, it may suddenly, and without apparent cause, become progressively worse and die in a short time.

Treatment of Acute Diffuse Peritonitis

DR. H. A. GAMBLE, Memphis, Tenn.: The abdomen is opened under general anesthesia, the primary lesion is removed or repaired, split rubber drainage tubes with gauze wicks are introduced into Morrison's pouch, the pelvis, and wherever else indicated, and the work is completed as expeditiously as possible. Free drainage is maintained, elimination promoted, the strength of the patient sustained, and complications are guarded against. The patient is put in the sitting posture, and 500 c.c. of physiologic sodium chlorid solution are injected subcutaneously. This is repeated from every four to six hours. Plain warm water is started also at once by Murphy's method of proctoclysis. Dressings are changed frequently, from every one to two hours, for the first twenty-four hours. The most important complications to be guarded against, in the order of their frequency, are acute dilatation of the stomach, secondary abscesses, intestinal obstruction, and phlebitis.

Latent Manifestations of Syphilis in and About Joints

DR. EDWARD S. HATCH, New Orleans: Joint syphilis is much more common than is generally supposed. In the roentgen findings and in the luetin reaction we have nearly positive diagnostic aids. A roentgenogram, a Wassermann test and a luetin reaction should be made in all suspected cases, and then, if there is doubt, the therapeutic test should be applied.

Use of Radium in Nonmalignant Uterine Hemorrhage

DRS. C. JEFF MILLER and E. L. KING, New Orleans: The nonmalignant conditions of the uterus causing menorrhagia or metrorrhagia may be thus grouped: 1. Cases in which there is little or no demonstrable pathologic change in the uterine wall, no history of infection, and in which the uterus is apparently normal in size and position, with normal adnexa. In such cases, the bleeding is, in all probability, due to some disturbance of the internal secretions, especially of the thyroid or of the ovary. This condition is often encountered in young girls about puberty. 2. The menopause. 3. Chronic metritis. 4. Hypertrophy or hyperplasia of the endometrium, especially when so marked as to be adenomatous or polypoid in character. 5. Fibroids, adenomas or adenomyomas of the uterus. 6. Chronic endometritis, especially after incomplete abortion. 7. Passive congestion of the uterus, as in retroflexion or prolapse. In the first three groups, radium may be used to the exclusion of surgery; in the fourth and fifth, some cases are suitable for radium and others require operation; while in the sixth and seventh groups, operation is indicated.

We have treated ten cases classified under the first two groups. In all of them the bleeding had persisted for years and had resisted every form of treatment. Nine of the patients were given intra-uterine radium treatments, the average dose being about 1,000 milligram-hours. In only one patient did the treatment fail to relieve the condition. Only one patient suffered from severe menopausal symptoms, although in several of them the symptoms were present in a mild degree.

Eighteen cases fall in the third and fourth groups. The patients ranged in age from 30 to 55, and most of them had suffered from bleeding for several years—as a rule, menorrhagia first, and later metrorrhagia as well. In every case, radium treatment was followed by amenorrhea; in two patients there was a recurrence of the bleeding about one year later, the flow being approximately normal. The others are still relieved. Six patients suffered from marked menopausal symptoms; five others were similarly affected, but the symptoms were mild and transient. The patients suffering most from the artificial menopause were nearly all between 40 and 51; this coincides with our experience after hysterectomy. In three women, aged 35, 45 and 51, the condition was relieved by corpus luteum extract. Eight patients suffered from leukorrhea for two or three months after the treatment. In those cases in which subsequent pelvic examinations were made, marked reduction in the size of the uterus was found, and the tenderness, as a rule, disappeared. The dosage in these cases was from 500 to 1,000 milligram-hours.

Rôle of Syphilis in Surgery

DR. GEORGE GELLHORN, St. Louis: I have seen extensive suppurations of the abdominal incision resist all possible treatments for weeks, but turn into clean and vigorously

granulating wounds when antisyphilitic treatment was instituted. I have in my care a woman with tertiary syphilis in whom several surgeons have unsuccessfully attempted to repair a third degree laceration of the perineum. I subjected this patient to energetic antisyphilitic treatment with the view of softening the cicatricial tissues about the vulva, and of forestalling disturbances of wound healing. In the course of this treatment, which included several injections of salvarsan, a laparotomy for pus tubes became necessary, and the patient went through this operation without the slightest complication.

(To be continued)

KENTUCKY STATE MEDICAL ASSOCIATION

Sixty-Seventh Annual Meeting, held at Louisville, Nov. 6-9, 1917

The President, DR. P. H. STEWART, in the Chair

A Plea for Better Diagnosis.

DR. R. M. RANKIN, Covington: Standing in the foreground among the means for accomplishing the purpose of this plea is the grouping of physicians in institutions and in office buildings in cities and towns. Success presupposes a leader, with competent workers properly equipped. The superior diagnostician working alone is superior, perhaps in greatest measure, by reason of his doing as well as he may the work performed by specialists comprising the group. Specialists in particular fields probably succeed in making diagnoses by reason of special knowledge of the symptomatology pertaining to that field and by special effort to elicit the symptomatology. Better equipment oftener used would add materially to the efficiency of all of us.

DISCUSSION

DR. W. A. JENKINS, Louisville: It is a good sign to see the universal interest that is being manifested in the making of proper diagnoses. Even the laity, after hearing addresses before civic audiences, health boards, and other bodies of a similar character, are now recognizing the importance, the necessity and the desirability of accurate diagnoses. It is only by education and careful training in all modern methods that accurate diagnoses can be made.

DR. BERNARD ASMAN, Louisville: It is not unusual to see a patient suffering from advanced cancer who has been treated and is still being treated for some simple ailment presumably the cause of the trouble.

The Precancerous State and the Increase of Cancer

DR. A. H. BARKLEY, Lexington: When patients present themselves because of a condition that is suspicious of beginning cancer, or one that is likely to become so ultimately, they should be examined thoroughly and conscientiously, and the benefit of any doubt should be given the patient. By means of lectures the public should be taught the great benefit to be derived from periodic examinations from head to foot. In cancer, as in other diseases, attention to diet, exercise and proper hygienic surroundings is of distinct value.

Precancerous Lesions

DR. IRVIN ABELL, Louisville: Notwithstanding the possibility of underlying general factors, cancer may, for all practical purposes, be regarded as local in its beginning. Prominent among the predisposing factors for which one should be on guard are: general lowered nutrition; chronic irritation and inflammation; repeated acute trauma; cicatricial tissue, such as lupus and other scars, and burns, benign tumors, warts, moles, nevi, etc.; also the fact that changes occurring in the character of such tumors and tissues, as well as the occurrence of any abnormal discharge from any part of the body, especially if blood stained, are to be regarded as suspicious. Some occupations, notably working in pitch, tar, paraffin, anilin or soot, and with roentgen rays, if not safeguarded, are conducive to the production of cancer, presumably on account of the chronic irritation or inflammation caused. The finding of any abnormal condition about the body should be taken as an indication for competent professional and not personal attention.

DISCUSSION

DR. J. GARLAND SHERRILL, Louisville: It should be the duty of the physician to educate his patient to keep away from sources of local irritation. Whatever the relationship between an injury to the tissues and the development of cancer, it is our duty to urge these patients to take care of this irritation or injury, in order that they may not develop malignant disease later.

Diagnosis of Gallbladder Disease

DR. A. W. NICKELL, Louisville: We are principally interested in two types of this disease, cholecystitis and cholelithiasis. Gallbladder disease is second in importance only to appendical inflammations. In the operations for gallbladder disease, there was sufficient pathologic justification for removal of the appendix in 69 per cent. of MacCarty's cases, and in 68.2 per cent. of Smithies' cases. While the gallbladder is the seat of stones in the majority of cases, inflammation of a noncalculous origin may occur. In 1,000 cases reviewed by Smithies, there were 434 cases of acute and chronic cholecystitis in which neither gallstones, "sand" nor malignancy was demonstrable. Out of this number of 434 acute and chronic cases, 228 were of the acute catarrhal type. Stones complicated in 51 per cent., and "sand" in 8 per cent. Cholecystitis will occur in old persons with the former state of health fairly good after indiscretion in diet. Symptoms similar to gallstones may be caused by pancreatic calculi; but these cases are so rare that they scarcely enter into the diagnosis. Floating kidney may simulate gallstones. The most difficult cases to diagnose are those in which the gallbladder, stomach and bowel are bound together by adhesions by either numerous attacks of gallbladder inflammation or ulcer. There is, then, a commingling of gastric and hepatic symptoms with hyperchlorhydria. We may have to differentiate the crises of locomotor ataxia. A good rule in all cases of supposed gallstone colic is to test the knee jerk, station and pupils. The Wassermann test is of value here.

Skin Lesions Due to Focal Infection and Septicemia

DR. M. L. RAVITCH, Louisville: Most cases fall under three heads. First is the type in which the lesion is confined so closely to the tissues near the focus of infection as to suggest very strongly infection along lymphatic channels or by contiguity of adjacent structures. The lesions are usually considerably elevated, more or less irregular in outline, fairly well defined, and nearly always distinctly red or pink, instead of purple or bluish as seen in other types. The second class includes lesions caused by hematogenous infection from one or more foci of infection. Instead of being confined to the locality of the focus, the lesions may appear in quite distant tissues; there may be recurrent crops well generalized, or fairly persistent patches in one or two areas. There seems a certain amount of predilection for the head, neck and upper chest when the focus is above the trunk; the abdomen is more apt to show the lesions in appendical or renal abscess. The third class is the most dangerous. Here we are dealing with a septicemia, sometimes quite mild, sometimes very virulent. In addition to the skin lesions, there is nearly always discoverable an arthritis, endocarditis, septic nephritis, or endometritis. Frequently the onset of the septicemia manifests itself by the appearance of scattered hemorrhagic elevated nodules in the skin, sometimes confined to one locality of the body, but more usually appearing on the face, abdomen, thighs and ankles, if not all over the body. Within a week the infection of the skin has reached its height, and it usually begins to ameliorate somewhat after that, although fresh lesions may appear from time to time. The importance of recognizing these lesions cannot be overestimated. They are not only frequently the first symptoms of a virulent endocarditis, but often they lead to the detection and removal of a hitherto unsuspected, but very dangerous, focus of infection, in mouth, throat, ear, sinus or elsewhere. It should be the routine with physicians, whenever a case of erythematous lesions or purpuric patches comes under observation, to make a thorough examination for such infectious foci.

(To be continued)

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

November, CLIV, No. 5

1 *Comparative Value of Wassermann, Colloidal Gold and Other Spinal Fluid Tests; Study of Two Hundred and Three Cases. E. M. Hammes, St. Paul, Minn.—p. 625.
2 *Causation of Edema in Chronic Parenchymatous Nephritis; Method for Its Alleviation. A. A. Epstein, New York.—p. 638.
3 Complement Fixation Test in Diagnosis of Tuberculosis; Study of One Hundred and Thirty-Five Cases. G. W. McCaskey, Fort Wayne, Ind.—p. 648.
4 Case of Scleroderma of Skin. A. S. Robinson, Cleveland.—p. 657.
5 Cure of Prolapse of Uterus. J. A. McGlinn, Philadelphia.—p. 673.
6 Gastric Polyposis; Report of Cases. J. M. T. Finney and J. Friedenwald, Baltimore.—p. 683.
7 Etiology and Treatment of Hemorrhagic Diseases. S. H. Hurwitz, San Francisco.—p. 689.
8 *Colon Bacillus Pyelitis Considered with Reference to Cases in Boy Subjects; Case Reports. G. W. Graves, New York.—p. 707.
9 *Studies of Cerebrospinal Fluid in Acute Anterior Poliomyelitis. J. A. Kolmer, A. E. Freese, T. Matsunami and B. M. Meine, Philadelphia.—p. 720.
10 Posttransfusion Reactions; Review of Two Hundred and Eighty Transfusions Performed in Wards of Presbyterian Hospital, New York. H. E. Meleney, W. W. Stearns, S. T. Fortuine and R. M. Ferry, New York.—p. 733.
11 Meningitis Sympathica; Report of Cases. I. Strauss, New York.—p. 748.

1. **Wassermann and Spinal Fluid Tests.**—This paper comprises the study of 203 cases: 43 paresis, 34 tabes, 27 cerebrospinal syphilis, 4 congenital syphilis, 11 meningitis, 3 tetanus and 81 other nonsyphilitic organic and functional conditions. The characteristic paretic curve of the colloidal gold reaction was found in 42 cases out of 43 spinal fluids examined. Four cases gave a negative Wassermann in the blood; all showed a marked positive globulin test; all but 5 had a lymphocytosis of over ten cells per cubic millimeter. Of the three atypical reactions, 1 occurred in a very early case, 1 was probably due to an old and infected spinal fluid, and 1 was made after vigorous intraspinal therapy.

In the miscellaneous group (76 cases) all findings were practically normal. The Wassermann in the spinal fluid in all cases was negative. One blood gave a positive Wassermann, the cell count was normal except in 2 cases of meningismus, in 1 brain tumor and in 1 spinal cord tumor; the globulin test was negative in all but 1. The colloidal gold test showed nothing definite except occasionally a slight decolorization in the lower dilutions. In 3 cases of multiple sclerosis all findings were negative, but in 1 case the colloidal gold test showed a typical paretic curve with a negative Wassermann test.

The effects of antisyphilitic treatment on these tests have been variable. In the main the syphilitic cases have been treated with salvarsan, intravenously and intraspinally (Swift and Ellis method), combined with mercury. In all cases there has been a gradual reduction of the cell count to normal. In the majority of cases the globulin test has become normal while in some it remained slightly positive. In 21 cases of paresis, treated thoroughly, all but 2 gave a negative blood Wassermann. However, in the spinal fluid it persisted positive in every case. Out of 22 cases of tabes treated, 16, or 73 per cent., gave a negative Wassermann both in the blood and spinal fluid. In only five instances of all antisyphilitic cases treated did the author notice any change in the colloidal gold curve, and in only 1 case did the curve become normal. Hammes concludes that no spinal fluid test (except the presence of bacteria) is specific. Every test is simply that much cooperative evidence and should be combined with the history of the case and the clinical findings.

2. **Causation of Edema in Chronic Nephritis.**—The problem in the treatment of edema in chronic parenchymatous nephritis is to relieve the condition and prevent its recurrence. The mere removal of effusion fluid by paracentesis and puncture, if feasible, may relieve it partly, but does not, as a rule, prevent a reaccumulation. The indications are: (1) to increase the protein content of the blood and thus help it regain its normal osmotic power, and (2) to remove or cause the reabsorption by the tissues of the excessive lipoids. The restoration of the protein content may be accomplished by two methods: (1) Massive infusion or transfusion of healthy blood accompanied by the removal of equal quantities of blood from the patient. The latter procedure is necessary to accommodate the introduction of additional blood so as not to embarrass the circulation. It also serves to remove some of the excessive lipoids. (2) Most important is the proper administration of a high protein and fat poor diet. The employment of transfusion is undoubtedly helpful and affords a good start in the treatment, but is not always feasible for obvious reasons. Chief reliance must therefore be placed on adequate dietetic measures. These consist in the administration of large quantities of properly selected proteins with a minimum of carbohydrates and the exclusion of fats. The fluid allowed is restricted to the quantity present in the food, plus that which is necessary for the comfort of the individual patient, amounting usually to from 1,200 to 1,500 c.c. The amount of salt allowed is the quantity sufficient to make the food palatable.

8. **Colon Bacillus Pyelitis.**—Pyelitis in boys, although far more infrequent than in females, Graves says, is, from the standpoint of the individual case, possibly even more important. In the male subject the possibility of extension of infection through the lumen of the urethra may be excluded, and in the treatment of all cases the intestine is to be recognized and dealt with as the potential source of the disease. The possibility of the occurrence of unusual and severe systemic manifestations in well developed pyelitis should be better appreciated. The best routine treatment for pyelitis in children is the administration of sufficient alkali to render the urine alkaline and maintain this reaction. If hexamethylenamin is employed the formaldehyd excretion should be watched and the urine should be examined frequently, with a view of forestalling injurious effects on the kidney parenchyma. In all obstinate cases autogenous vaccine should receive a thorough trial.

9. **Cerebrospinal Fluid in Poliomyelitis.**—In the recent epidemic of poliomyelitis in Philadelphia the examination of cerebrospinal fluids made by the authors yielded the following results: The majority of the fluids were water clear or but faintly opalescent when viewed against a black background; but 1 or 2 per cent. of blood free fluids presented distinct turbidity. Xanthochromia and excessive fibrin formation were not found; about 10 per cent. of the fluids presented a small fibrin coagulum after standing several hours. Of the fluids, 77 per cent. from all stages showed an increase of total cells; in 80 per cent. of these the counts were not above 100 cells per cubic millimeter of fluid. An increase of the total cells was found in the preparalytic stage, and this increase was present in 95 per cent. of cases for at least three weeks after the onset of paralysis, after which the number of cells gradually decreased. In over 96 per cent. of fluids from cases after the onset of paralysis the small lymphocyte variety of cells predominated. Polymorphonuclear cells predominated in less than 1 per cent. of fluids, and in over 88 per cent. constituted less than 25 per cent. of the cells present. An increase of protein was found in from 32 to 42 per cent. of fluids, and different tests for protein yielded varying results.

During the acute stages of poliomyelitis the fluids from 40 to 50 per cent. of cases yielded a colloidal gold reaction of the syphilitic and meningitic zone types. All yielded negative Wassermann reactions. The potassium permanganate reduction test yielded positive reactions of indexes over 2.3, with the spinal fluids of 41 per cent. of cases examined from the second to twenty-first days after the onset of paralysis; a high reduction index indicates an increase of protein in the fluid, and may aid, therefore, in the diagnosis of acute poliomyelitis. Every fluid was found to contain sufficient glucose to reduce Fehling's solution in some degree; partial reduction of the amount of glucose was suspected with a number of

fluids on the basis of a qualitative test. Increased permeability of the meninges was indicated by the presence of natural antisheep hemolysin in the fluids of 66 per cent. of cases in the acute stages and both the hemolysin and a hemolytic complement in 30 per cent. Both of these substances were absent in the fluids of control persons. Substances inhibiting saponin hemolysis were not found in the fluids of cases two to twenty-one days after the onset of paralysis.

Boston Medical and Surgical Journal

November 15, CLXXVII, No. 20

12 *Study of Operative Treatment of Osteartbritis of Hip Joint. M. Ozarki, Japan.—p. 679.
13 *Treatment of Myelocytic Leukemia by Radium. H. Z. Giffin, Rochester, Minn.—p. 686.
14 Lymphocytosis; Clinical Study from Group Diagnosis. J. M. Read, San Francisco.—p. 691.
15 Vegetative Nervous System from Clinical Viewpoint. M. S. Woodbury, Clifton Springs.—p. 695.
16 Health Insurance and Medical Profession—from Financial and Administrative Point of View. R. M. Bradley, Boston.—p. 698.
17 Goiter Surgery; Report of Twenty-Eight Cases Operated, with One Death. G. Torrance, Birmingham, Ala.—p. 700.
18 Meningeal Syndrome and Other Sources of Error in Pyelitis. H. W. Dana, Boston.—p. 702.

12. **Operative Treatment of Osteartbritis of Hip Joint.**—Ozarki is of the opinion that in monarticular, nontuberculous cases it is always possible to relieve the disability of the leg by an arthrodesis, which can be repeated, if necessary. In polyarticular cases, if both hips are involved, the motion in one of the hips must be restored by some such operation as decapitation of the head of the femur. In cases of tuberculosis definite relief cannot be expected to the same degree as in osteartbritis, but the operation has produced no bad effect on the general or local condition, and has given marked benefit in the majority of the cases. Arthrodesis has appeared to be especially beneficial in cases which have arrived at a stage of disability where the patient is demanding a more serviceable leg. The leg will be stronger and less troublesome after the operation, and hence arthrodesis is the operation of choice in cases in which only one hip is involved. If an operation is required to restore motion in a joint, careful judgment must be used. In one case in which the osteartbritic affection was supposed to have subsided, it was thought that motion could be restored to the joint by a total excision of the head of the femur. If partial excision were the method chosen, it would be necessary to apply some protection against bony and capsular adhesions, and for this purpose the best material is furnished by free flaps of the deep fascia of the thigh, according to Dr. M. Sumita of Fukuoka, Japan, who in the year 1915 reported over eighty excellent results of various joints. This method will be successful if the refreshed bone surfaces are free from pathologic processes.

13. **Treatment of Myelocytic Leukemia by Radium.**—Thirty consecutive cases of myelocytic leukemia were treated at the Mayo Clinic by means of the surface application of radium element over the enlarged spleen. A certain degree of general improvement, together with reduction of the size of the spleen and of the leukocytic count, occurred in every instance, even in the most advanced and toxic cases. Marked temporary improvement occurred in twenty-six patients, and a remarkable improvement in thirteen. Hemorrhage ceased as a rule after one or two series of exposures. In two instances, hemorrhage occurred after radium exposures when it had not occurred previous to treatment. In these instances the hemorrhage seemed to be the result of overexposure; an anemia also developed; both the hemorrhage and the anemia were successfully combated by means of transfusion. In twenty-five patients there was definite improvement of the anemia concomitant with the improvement of the general condition. The reduction of the number of leukocytes was due chiefly to not only an absolute but also a striking relative fall in the myelocytes; there was a striking fall in the absolute count of polynuclears, while their relative percentage remained approximately the same. There was also a marked fall in the absolute count of small lymphocytes. Surface exposures of radium over the spleen of myelocytic leukemia usually effect a very rapid reduction of the size of the spleen, a fall of the leukocyte count, improvement in the general condition and together with transfusion, constitute at present the most effective temporary measure in the treatment of the disease.

Canadian Medical Association Journal, Toronto

November, VII, No. 11

19 Technic of Nerve Suture. S. A. Smith.—p. 974.
20 Suppurative Conditions in Lower Respiratory Tract. Medical Aspects. A. McPhedran, Toronto.—p. 992.
21 Id. Surgical Aspects. E. M. von Eberts, Montreal.—p. 1000.
22 Id. Roentgenologic Aspects. W. A. Wilkins, Montreal.—p. 1005.

Indiana State Medical Association Journal, Fort Wayne

November, X, No. 11

23 *Abdominal Wounds in War. J. R. Eastman, Indianapolis.—p. 417.
24 *Pretended Blindness and Deafness and Their Detection. G. F. Keiper, Lafayette.—p. 422.
25 Wassermann Reaction. Necessity for Clearer Understanding of Its Significance and Fallacies. B. W. Rhamy, Fort Wayne.—p. 427.

23 and 24. Abstracted in THE JOURNAL, Nov. 3, 1917, p. 1560.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

November, X, No. 5

26 *Attempts to Produce Substance with Thyroid-Like Activity by Artificial Iodization of Proteins. J. M. Rogoff and D. Marine, Cleveland.—p. 321.
27 *Influence of Ergotoxin on Body Temperature. T. S. Githens, New York.—p. 327.
28 *Pharmacologic Studies of Ipecac Alkaloids and Some Synthetic Derivatives of Cephaelin. Studies on Protozoocidal and Bactericidal Action. A. L. Walters, W. F. Baker and E. W. Koch, Indianapolis.—p. 341.
29 *Changes in Rhythmicity, Irritability and Tone in Purged Intestine. W. C. Alvarez and F. B. Taylor, San Francisco.—p. 365.
30 Comparative Activity of Local Anesthetics. Paralysis of Motor Nerve Fibers. T. Sollmann, Cleveland.—p. 379.

26. **Artificial Iodization of Proteins.**—Employing the method described by Kurajeff, Rogoff and Marine have artificially iodized whole ox serum, ox serum globulin (obtained by half saturation of the serum with ammonium sulphate), ox serum albumin (obtained by saturating the filtrate of the globulin with ammonium sulphate), Merk's egg albumin and egg white (obtained from fresh eggs). It was found that artificially iodized blood serum (ox) causes acceleration of metamorphosis when fed to tadpoles, resembling that shown by thyroid, but not so marked nor so rapid. It is possible to show by crude process of separation that the globulin fraction of the serum contains most of the substance with which the iodin combines to give the activity of tadpoles. Alkaline hydrolysis of iodized proteins apparently destroys their activity, therein differing from thyroid. This suggests that the thyroid adds something to the iodin complex in the blood to complete the stable iodin containing thyroid hormone.

27. **Influence of Ergotoxin on Body Temperature.**—The facts reported by Githens seem to show that in many species ergotoxin exerts a specific influence on the heat-regulating center, disturbing the relation between heat production and heat dissipation. In cats and in rabbits this induces a rise of body temperature; in rats, mice and pigeons it causes a fall.

28. **Protozoocidal and Bactericidal Action.**—Emetin hydrochlorid in solution of 1:1,000 when acting on water amebas for one hour, or in solution of 1:5,000 acting for three hours, destroyed many of these organisms but was not uniformly amebacidal. Emetin hydrochlorid in solution of 1:200,000 in contact with cultures of amebas for one hour, four hours, or seven hours destroyed many amebas, but transplants from these cultures to fresh agar plates showed a retarded or delayed growth of amebas, owing probably to the development of encysted or resistant forms. Emetin hydrochlorid in solutions as strong as 1:100 are not rapidly destructive to the *Endameba buccalis*, in some cases not killing it in one hour. The propyl and iso-amyl ethers of cephaelin are stronger than emetin as amebacides but their action on water amebas or the *Endameba buccalis* cannot be used satisfactorily as a comparative measure of this action. Methylating

cephaelin to form emetin is known to increase the endamebacidal action as well as the protozoocidal action toward paramecia and the substitution of the methyl group by ethyl, propyl, butyl, iso-amyl or allyl further intensifies this action. The propyl, butyl and iso-amyl ethers of cephaelin possess much stronger protozoocidal properties than the methyl ether (emetin). Cephaelin iso-amyl ether phosphate was the most effective alkaloid of this group in killing paramecia, being fifteen to twenty times as active as emetin phosphate. Tested on *Staphylococcus aureus* in the manner described, cephaelin propyl ether phosphate is germicidal in solutions of 1:222, and cephaelin iso-amyl ether phosphate in solutions of 1:4,120. Both of these derivatives are much stronger than emetin in germicidal action.

29. **Changes in Purged Intestine.**—The well purged rabbit is likely to be apathetic and to look sick. Its bowel is full of gas and fluid, and the mesenteric circulation is disturbed. Excised segments beat poorly and irregularly in Locke's solution, and they fatigue quickly. They respond poorly to drugs. Some parts of the bowel are abnormally irritable while others fail to respond at all to powerful stimuli. This unevenness in the gradient of muscular forces must interfere with the steady progress of food through the intestine; and probably favors the production of colic and gas pains. The conclusion drawn by Alvarez and Taylor is that it is not wise to purge shortly before an operation in which the bowel must stand the insults of drying, handling, cutting and sewing.

Journal of Urology, Baltimore

October, I, No. 5

31 *Control of Symptoms of Diabetes Insipidus by Subcutaneous Injections of Extracts of Hypophysis Cerebri (Pars Posterior and Pars Intermedia.) L. F. Barker and H. O. Mosenthal, Baltimore.—p. 449.

32 *Effect of Thyroid Medication on Basal Metabolism, Renal Function and Nitrogen Balance in Chronic Nephritis and in Hypothyroidism. B. D. Bowen and W. M. Boothby, Boston.—p. 469.

33 Comparative Study of Rate of Excretion of Nitrogenous Waste Products to Their Blood Concentration in Experimental Uranium Nephritis. C. K. Watanabe, New York.—p. 485.

34 New Universal Urethroscope with New Diagnostic and Therapeutic Fields of Application. L. Buerger, New York.—p. 495.

31. **Control of Diabetes Insipidus.**—Thus far, comparatively few cases treated by the injection of posterior lobe extract have been reported. The treatment of the patient, detailed by Barker and Mosenthal yielded results that did not differ appreciably from those reported by other authors who have injected posterior lobe extracts. The facts given may, therefore, be considered as confirming previous observations. The response of the kidneys to numerous injections was constant throughout. The most favorable effect was obtained when two or more injections of not less than 1 c.c. each, were given during the course of the day. This patient was made perfectly comfortable, and apparently the efficacy of the extract did not diminish over a period of four weeks' trial in the hospital nor after about one month's continuation of the therapy at home. The patient having once experienced the relief afforded by the injections refused to do without them. Tethelin and epinephrin do not seem to be of any value in the treatment of diabetes insipidus.

32. **Effect of Thyroid Medication on Basal Metabolism.**—The effects of thyroid treatment, as measured by clinical, renal function and metabolic studies, are reported by Bowen and Boothby in two cases of myxedema, complicated by symptoms of chronic nephritis, and in three cases of chronic nephritis in which there was no evidence of thyroid insufficiency. In the first group thyroid medication produced a marked improvement in the clinical and metabolic conditions together with some improvement in the renal function. In the nephritic cases, however, no improvement occurred from its use, and indeed in two cases decidedly injurious effects were produced. The authors state that although thyroid medication has been recommended as a means of satisfactorily treating cases of nephritis, is not indicated unless there is an associated condition of myxedema. The degree of thyroid insufficiency and the effect of treatment thereon can best be gaged by the determination of the basal metabolism.

Kansas Medical Society Journal, Topeka

November, XVII, No. 11

35 Mastoiditis with Intracranial Complications. E. N. Robertson, Concordia.—p. 293.

36 Cholecystectomy. H. L. Charles, Atchison.—p. 296.

37 Some Observations on Gallstones. W. J. Aldrich, Independence. —p. 298.

38 Intercostal Neuralgia. J. J. Harrington, Osawatomie.—p. 299.

Medical Record, New York

November 24, XCII, No. 21

39 Should Certain Tuberculous Patients Work? M. Fishberg, New York.—p. 881.

40 Treatment of Cancer at Anus. C. J. Drueck, Chicago.—p. 887.

41 Some Reasons Why Hospitals for Insane Are Overcrowded. W. M. Kenna, Mount Vernon.—p. 890.

42 Pellagra; Its Etiology, Symptomatology and Treatment. J. F. Yarbrough, Columbia, Ala.—p. 892.

43 Hyperthyroidism. M. F. Morris, Jr., Chelsea, Mass.—p. 895.

44 Vomiting of Pregnancy. W. J. Caesar, Richmond, Calif.—p. 897.

Nebraska State Medical Journal, Norfolk

November, II, No. 11

45 New Appreciation of Mastoid Operations. J. J. Hompes, Lincoln. —p. 477.

46 Effect of Sinus Disease on Eye. F. F. Teal, Lincoln.—p. 479.

47 Conservation of Vision and Hearing. E. C. Hayman, Lincoln. —p. 481.

48 Puerperal Sepsis. I. C. Munger, Cozad.—p. 483.

49 Deficiencies in Young. J. M. Aikin, Omaha.—p. 488.

50 Early Diagnosis of Breast Cancer. C. H. Waters, Omaha.—p. 490.

51 Ludwig's Angina. E. R. Hirsch, Superior.—p. 492.

52 Cystoscopic Findings and Pyelography. C. Emerson, Lincoln. —p. 498.

53 Artificial Feeding of Infants. C. R. Spicer, Hastings.—p. 500.

54 Use of Lactic Bacilli Milk. H. M. McClanahan, Omaha.—p. 503.

55 Dento-Alveolar Abscess with Sinus Through Cheek. A. F. Tyler, Omaha.—p. 505.

56 Resection of Colon for Epilepsy. H. W. Wightman, Omaha.—p. 505.

New York Medical Journal

November 24, CVI, No. 21

57 Tuberculosis Treated by Tuberculin. R. C. Newton, Montclair, N. J.—p. 965.

58 Diagnosis of Pulmonary Tuberculosis in Children Issued by National Association for Study and Prevention of Tuberculosis. M. Fishberg, New York.—p. 967.

59 Prophylaxis in Syphilis of Central Nervous System. I. Rosen, New York.—p. 970.

60 Study of Drug Action. T. J. Mays, Philadelphia.—p. 973.

61 Urinary Antiseptics. A. K. Detwiler, Omaha.—p. 976.

62 State Examinations and Treatment for Eye Disease in Schoolchildren. A. Rovinsky, New York.—p. 978.

63 Colored Photomicrographic Slides of Sections. E. A. Hunger, Rochester.—p. 983.

New York State Journal of Medicine

November, XVII, No. 11

64 How Can We Safeguard Child against Mental Disease? J. Taft, New York.—p. 481.

65 Psychology vs. Psychiatry in Diagnosing Feeblemindedness. W. B. Cornell, New York.—p. 485.

66 Mentality and Intelligence Tests. J. L. Herrick, Albany.—p. 486.

67 Various Phases of Feeblemindedness and Stigmata of Degeneration. Physical Types, etc. C. Bernstein, Rome.—p. 490.

68 Assistance of Roentgen Ray in Diagnosis of Pulmonary Tuberculosis. F. H. Heise and H. L. Sampson, Trudeau.—p. 499.

69 Serum Diagnosis of Tuberculosis. H. R. Miller, New York.—p. 501.

70 Bacteriology of Paratyphoid Fever. C. Krumwiede, Jr., New York.—p. 503.

71 Laboratory Service in Epidemic of Paratyphoid Fever among Troops. A. B. Wadsworth, Albany.—p. 506.

72 Cases of Fractures of Neck of Femur in Children. H. L. Taylor, New York.—p. 508.

73 Bronchoscopy and Esophagoscopy. J. W. Murphy, Cincinnati.—p. 513.

Pennsylvania Medical Journal, Athens

November, XXI, No. 2

74 Factors of Safety in Abdominal Hysterectomy. D. Guthrie, Sayre.—p. 65.

75 Surgical Treatment of Prostate. E. S. Judd, Rochester, Minn.—p. 72.

76 Principles of Pathology of Prostate. W. C. MacCarty, Rochester, Minn.—p. 76.

77 Selection of Cases for Prostatectomy. J. B. Deaver, Philadelphia. —p. 78.

78 Remote Symptoms of Prostatitis and Spermatocystitis. T. Baker, Pittsburgh.—p. 82.

79 Poliomyelitis. Study of 1916 Epidemic in Philadelphia. T. H. Weisenburg and S. S. Leopold, Philadelphia.—p. 86.
80 Id. Early Recognition; Value and Technic of Spinal Puncture. J. F. Sinclair, Philadelphia.—p. 92.
81 Alcoholism; Some Complications and Their Treatment. J. C. Doane, Philadelphia.—p. 96.
82 Treatment of Pneumonia in Early Life. H. T. Price, Pittsburgh. —p. 99.
83 Oral Sepsis. S. B. Luckie, Chester.—p. 103.
84 *Analysis of Nine Hundred and Ninety-Eight Consecutive Complete Blood Counts. F. B. Utley, Pittsburgh.—p. 106.

84. **Analysis of Blood Counts.**—In the 998 blood counts made by Utley the polymorphonuclear leukocytes were increased over the accepted normal percentage of 70 in 179 smears. This increase was found in patients suffering from infections, acute or pyogenic. They were diminished under 65 per cent. in twenty smears without an abnormal increase in any other group of cells with which they might be classed. This diminution occurred in asthenic conditions, or in those patients who are regarded to have an abnormally low resistance. Of the 998 differentials made, there were eighty-eight which had an absolute eosinophilia or over 250 eosinophils per cubic millimeter. In fifty-one, or in 57.9 per cent. of the cases, eosinophilia did not assist in the diagnosis in the light of present knowledge. There was an eosinophilia in twelve cases of intestinal putrefaction, indicating a correlation of the chemotactic action of intestinal parasites and of intestinal putrefaction. Basophils in excess of 1 per cent. were present in twenty-six cases. The presence of basophilia was not of much help in diagnosis. In general, it was present in asthenic conditions. Myelocytes were present in fifteen cases. Twelve were patients suffering from pernicious anemia, one a patient suffering from angina pectoris, and two were patients whose condition was not diagnosed. Differentials showing lymphocytes in excess of 30 per cent. were regarded as showing a lymphocytosis. Practically all the cases fall within the prescribed list except those which could not be classified. There were 166 smears in which the large mononuclears were 5 per cent. or over.

The cases of syphilis, the various cachexias, malignant endocarditis, influenza, measles and Hodgkin's disease or twenty-three cases in all out of the 166 may be regarded as being in the usual group, leaving 143 cases or 86.2 per cent. of the cases ungrouped. In other words, in 86.2 per cent. of the cases the presence of large mononuclears in excess of normal can not be explained in the light of present knowledge. The asthenic group totals sixty-four cases, or 38.5 per cent. There were twenty-nine smears which showed so-called transitionals in excess of 5 per cent.. There were 272 normal counts, and these coincided with the clinical picture in each instance, except in a few cases of pernicious anemia and influenza where the differential might have been expected to be different. Adding to the 272 normal counts which were of no definite help in diagnosis, the undiagnosed cases in each group or 104, there were 376 counts out of the 998 made which had no direct bearing on the diagnosis, prognosis and treatment of the patient. Deducting from each group the number which had no classification in that group according to the light of our present knowledge, or 210, and adding these to the 376, there were 586 counts made which offered no direct assistance in the diagnosis, prognosis and treatment of patients. Of the remaining 412 counts the way to a diagnosis was pointed out in six of seven cases of intestinal parasites and in seventeen cases of pernicious anemia, or twenty-three in all. In the remaining 389 cases the blood count was helpful in diagnosis.

Psychiatric Bulletin, Utica, N. Y.

July, II, No. 3

85 War Neuroses. J. T. MacCurdy, New York.—p. 243.
86 Treatment of Mental and Nervous Diseases in United States Army. T. W. Salmon.—p. 355.
87 Mental Disorders Incident to War. A. Hoch, New York.—p. 377.

Washington Medical Annals, D. C.

November, XVI, No. 6

88 Epidemic Cerebrospinal Meningitis; Report of Sixteen Cases. F. Leech and J. W. Lindsay, Washington, D. C.—p. 307.

Wisconsin Medical Journal, Milwaukee

November, XVI, No. 6

89 Acidosis from Physiologic Chemical Viewpoint. C. J. Farmer, Milwaukee.—p. 187.
90 Tuberculosis and Draft Examinations. O. Lotz, Milwaukee.—p. 197.
91 Classification of Chronic High Blood Pressure Cases. L. M. Warfield, Milwaukee.—p. 200.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Disease, London

July-September, XIV, Nos. 163-165

1 Hypertrophic Stenosis in Infants; Analysis of One Hundred and Fourteen Cases. L. E. Holt.—p. 161.
2 Acquired Syphilis in Infants, with Remarks on Crèches. G. Pernet.—p. 168.
3 Treatment of Enlarged Cervical Lymph-Nodes in Children. C. G. Cumston.—p. 172.
4 Cerebral Degeneration and Epileptiform Fits, with Amaurosis, in Only Child. F. P. Weber.—p. 176.
5 Case of Lipodystrophia Progressiva in Male. F. P. Weber.—p. 179.
6 Congenital Word Blindness and Letter Blindness—Congenital Alexia, with Agraphia without Aphasia. F. P. Weber.—p. 183.
7 *Case of Congenital Defect of Duodenum, in which Bile was Found Both Above and Below the Absent Portion. E. A. Cockayne.—p. 188.
8 Fatal Case of Pelvic Cellulitis in Child. F. C. Pybus.—p. 192.
9 Acute Delirium in Lobar Pneumonia in Child. J. P. Parkinson. —p. 193.

7. **Congenital Defect of Duodenum.**—Cockayne's case occurred in a male child born at full term. There was no history of any similar condition in the family and the mother was in good health during her pregnancy. At the confinement it was noticed by the medical attendant that the liquor amnii was excessive in quantity and bright green in color. The child vomited liquid, which resembled the bile-stained liquor amnii, on the second day, and passed meconium of normal appearance. Slight jaundice was noticed on the third day. Vomiting continued at intervals, the vomit being invariably watery and green, but no more meconium was passed. The general condition became gradually worse until death took place on the fifth day. At the necropsy it was seen that the child was well nourished and without any external malformation. The skin was slightly icteric. On opening the abdomen the stomach was found to be greatly dilated and the first part of the duodenum to end blindly, being greatly distended and globular in outline. The pylorus was visible and palpable as a thickened constriction between these two organs. Some fluid stained with the bile was present in the stomach and distended first part of the duodenum. The bile-duct opened directly into the narrow commencement of the lower part of the duodenum, but the pancreatic duct entered the posterior aspect of the blind sac formed by the upper part of the duodenum. There was no connection except by peritoneum between the upper and lower portions of the duodenum; the missing part of the viscus was not even represented by a thin cord. The liver, gallbladder, cystic duct, hepatic duct, and common bile-duct were normal, and the gallbladder contained a considerable amount of bile. The most interesting feature of the case and one which made a correct diagnosis almost impossible, was the fact that a large quantity of bile-stained fluid was vomited, although the bile-duct opened into the lower part of the duodenum, and there was complete lack of continuity between it and the upper part.

Edinburgh Medical Journal

November, XIX, No. 5

10 *Lathyrism. R. Stockman.—p. 277.
11 *Lathyrism in Man. R. Stockman.—p. 297.
12 Case of Syringomyelia. D. M. Greig.—p. 308.

10. **Lathyrism.**—The results of many experiments on such animals, as the monkey, rabbit, pigeon, duck, pig and sheep made by Stockman showed that both the large peas (grown on dry wheat lands) and the small peas (grown on wet rice lands) of *Lathyrus sativae* are poisonous, but different samples

of peas vary greatly in toxicity. The poisonous substance is an alkaloid. Certain species of animals are very much more susceptible than others. Individual susceptibility varies greatly in the same species. With ordinary samples of the peas and in susceptible animals feeding has to be carried on for some time before toxic symptoms develop. Occasionally, however, the peas seem to be more poisonous and capable of causing more acute poisoning. In monkeys and in other susceptible lower animals prolonged feeding seems to cause a greater or lesser degree of paralysis of the peripheral nerves, along with other symptoms due apparently to an action on the central nervous system. A single large dose of the alkaloid paralyses the terminations of motor nerves, but other parts of the nervous system are also affected. Histologic examination of the muscle and nervous system in poisoned monkeys showed no structural changes.

11. **Lathyrism in Man.**—Lathyrism in man is a chronic nervous disease due to the habitual use as food of the peas of certain species of *Lathyrus* (vetchlings); it occurs endemically and epidemically. The symptoms appear only after the peas have been eaten for some time, the length of time varying according to the quantity consumed and the amount of poisonous alkaloid present. Individual susceptibility also appears to have a considerable influence as only certain persons in communities and families suffer, even when all are apparently equally exposed. A striking feature in every epidemic has been the large number of men affected as compared with women, generally estimated as ten or twelve to one. Two explanations of this have been given, the one, that men habitually eat more than women, the other, that men are more exposed to cold and wet and fatigue, conditions which seem to accentuate the action of the poison.

The patient first complains of cramps in the calves of his legs, and if he then stops eating the grain he may recover almost entirely, or only a little stiffness of his legs may remain. He is able to walk about without the aid of a stick, but an up-and-down movement of his shoulders may be noticed when he is walking. His toes may drag slightly on the ground. If he continues eating peas he may experience a somewhat sudden onset of paralysis. If he still eats peas he will lose control over the bladder and rectal sphincters. A very small number of patients are unable to stand even with the aid of sticks. The knee jerk is increased in all cases, sometimes more on one side than on the other, and the foot clonus is increased only in the severe cases. The muscles in the back of the leg are rigid. The muscles were found, as a rule, to be well nourished. Bed-sores were never seen. The paralysis of the sphincters passes off in a few weeks; sexual power is diminished or lost, but it may return. Sensory symptoms precede the paralysis, chiefly cramps, a feeling of tightness in the leg tendons, tingling, pins and needles and weakness at the waist. The gait is characteristic.

In the mild case the patient tends to raise his body high before the toes will leave the ground, and the up-and-down movement of the shoulders is the chief symptom noticed. In the more severe cases the patients use one or two sticks, and these sticks are always long. One stick is put forward and then the upper part of the body sways forward; the body becomes erect before the other stick is put forward. The dragging of the toes is the most marked symptom. The inner side of the nail of the great toe is worn away, and in bad cases the upper surface of the outer toes may be rubbed. There is nearly always a tendency to cross legged progression. No satisfactory examination of the spinal cord and peripheral nerves has ever been made. Treatment is generally said to be futile if the disease is fully developed.

Indian Journal of Medical Research, Calcutta

July, V, No. 1

13 Preparation of Vaccines on Large Scale. J. Cunningham, H. C. Brown and K. R. K. Iyengar.—p. 1.
14 Susceptibility of Indian Milch Cattle to Tuberculosis. W. G. Liston and M. B. Soparkar.—p. 19.
15 Wassermann Reaction as Explained by Major Nesfield. W. D. Sutherland.—p. 72.
16 Bacteriologic Studies of Cholera-Like Vibrios Isolated from Stools of Cholera Cases in Calcutta. Morphologic and Cultural Investigations. E. D. W. Greig.—p. 81.
17 Id. Feeding Experiments. E. D. W. Greig.—p. 89.
18 Dysentery in Jails of Eastern Bengal. J. Cunningham and H. H. King.—p. 96.
19 *Transmission of Plague by Bedbugs. J. W. Cornwall and T. K. Menon.—p. 137.
20 Studies in Flies. Classification of Genus Musca and Description of Indian Species. P. R. Awati.—p. 160.
21 Trematode Parasite of Anopheline Mosquitos. J. A. Sinton.—p. 192.
22 Anopheline Mosquitoes of Kohat District. J. A. Sinton.—p. 195.
23 Ankylostoma Duodenale as Parasite of Felis Tigris. C. Lane.—p. 210.
24 *Trichomastix (n. sp.) Parasitic in Human Intestine. G. C. Chatterjee.—p. 217.
25 Tricophyton Viannai n. sp. Infecting Agent in Case of Dermatomycosis. F. de Mello.—p. 222.
26 Effect of Intravenous Injections of Antimonium Tartaratum on Malarial Parasites. E. D. W. Greig.—p. 234.
27 Amebic Dysentery Carrier in India and Mesopotamia. W. MacAdam and R. Keelan.—p. 239.

19. **Transmission of Plague by Bedbugs.**—Cornwall and Menon point out that bugs which have fed on a case of septicemia plague must unquestionably be regarded as ambulant cultures of plague whose rupture will set free virulent plague bacilli. A large proportion of the bugs infected with a given strain of *B. pestis* succumbed in a few days, the time of survival having some relation to the dose of bacilli. If bugs died the final results were indistinguishable whether the initial dose were large or small. The majority of the survivors had entirely overcome their infection and contained no viable bacilli. Some common nonpathogenic bacteria are as fatal to bugs as the most pathogenic. Bugs with a bacterial infection generally refuse to feed for a long time. A sterile refeed, if the infection has not been entirely overcome, may lead to a fatal recrudescence. *B. pestis* can survive in the stomach of a bug, which has had one or more sterile feeds after the original infected feed, for at least thirty-eight days. *B. pestis*, recovered by culture from the stomach of an infected bug, retains its virulence for guinea-pigs. Peculiar protozoon-like involution or developmental forms of *B. pestis* may be seen in preparations from the stomachs of infected bugs. All attempts to obtain a growth of *B. pestis* by allowing infected bugs to feed on a sterile fluid through a rabbit skin membrane failed. All attempts to transmit plague to guinea-pigs by means of the bites of infected bugs failed. *B. pestis* sometimes finds its way from the stomach of a bug into the hemic cavity and thus produces a true septicemia. Infected bugs may die from toxemia before the occurrence of septicemia. *B. pestis* may be recovered by cultivation of the proboscis of a bug in broth within an hour of its infected feed. The presumption is that bacilli which have been stranded in the sucking tube multiply in the culture medium. Pressure on the body of a fed bug will not force the contents of its stomach out along its sucking tube. After an infected feed the proportion of bugs which can be expected to feed within a few hours on a normal animal and at the same time to have bacilli stranded in their sucking tubes is not likely to exceed 2 per cent.

24. **Parasite in Human Intestine.**—A flagellate was found by Chatterjee in the stool of a dysentery patient. No amebas were found in the stool. The patient suffered from intestinal complaints for a week and obtained relief by administration of castor oil emulsion. A cover-glass preparation made from the stool showed under the high power a large number of actively moving flagellates. Their appearance differed from the flagellates which are ordinarily found here, namely *Lamblia, Pentatrichomonas* or *Macrostoma*. Some of the flagellates were circular in shape. The flagellate resembles a *Trichomonas* but absence of an undulating membrane, a well marked axostyle and a tail prove that it is not a *Trichomonas*. It has some resemblance to *Copromastix prowazeki* of Aragao which has four flagella, but in the latter all the flagella are directed forward, whereas in the parasite under consideration one flagellum is directed backward. It has the structure of *Trichomastix* as defined by Parisi (three anterior flagella and one recurrent flagellum not adherent to the body to form an undulating membrane). As a *Trichomastix* inhabiting the human intestine has not hitherto been described, Chatterjee feels justified in describing it as a new species *Trichomastix hominis*.

Lancet, London

November 10, II, No. 4915

28 Causes of Disease. E. S. Reynolds.—p. 703.
29 *Later History of Cases of Gunshot Wounds of Chest, with Retained Missiles. R. D. Rudolf.—p. 709.
30 *Abnormal Median and Ulnar Nerve Supply in Hand. W. Harris. —p. 710.
31 *Cerebrospinal Fever; Mode of Invasion by Meningococcus. C. Worster-Drought and A. M. Kennedy.—p. 711.
32 *Action of Spinal Fluid in Stimulating Growth of Meningococcus. C. Shearer.—p. 714.
33 Removal of Shrapnel from Subclavian Artery. H. C. Donald. —p. 715.
34 Case of Complete Obliteration of Ulnar Artery by Suppuration. J. M. Barlet.—p. 715.
35 Digestibility of Bread Made from Two Parts of Wheat and One Part of Oats, Barley, Maize or Rice. E. I. Spriggs and A. B. Weir.—p. 724.

29. **Gunshot Wounds of Chest.**—An analysis made by Rudolf of fifty cases shows that evidence is lacking that small fragments of shell and shrapnel and likewise rifle bullets and shrapnel balls retained in the lung commonly give rise to any serious trouble. The mortality of gunshot wounds of the chest in patients that have survived the early days of their invalidism and been sent to England with retained missiles in the chest is practically nil if these foreign bodies be left alone. Hence, when it has not been considered necessary by the surgeons at the front to operate immediately, it should not be done later on, unless, indeed, some very definite indication, such as an abscess, exists.

30. **Abnormal Nerve Supply in Hand.**—Harris has seen four cases of abnormal nerve supply to the hand, two of the sensory distribution and two motor. In two cases the first and second dorsal interossei were quite unaffected in severe ulnar nerve lesions from gunshot wounds, indicating their supply to be from the median nerve in these cases, while the other two cases illustrated an abnormally large sensory supply by the ulnar to the inner two and a half fingers instead of the usual one and a half.

31. **Cerebrospinal Fever.**—Observation of a number of cases has convinced Worster-Drought and Kennedy that the mode of entry of the meningococcus is via the blood stream. In the ordinary type of case the coccus is carried to the meninges by the blood within a few hours without definitely infecting the blood itself. In some cases, however, blood infection (septicemia) occurs, for instance, in fulminating cases prior to the involvement of the meninges; the septicemia then frequently overshadows the meningitis. In rare cases the organism may remain, infecting the blood alone for a considerable time, before finally reaching the meninges, or the patient may die of such septicemia before meningitis can occur. In other instances the meningococcus infecting the blood may also invade structures other than the meninges, for instance, the cardiac valves. Catarrhal conditions predispose to meningococcal infection, but the meningococcus does not necessarily produce nasopharyngeal catarrh.

32. **Action of Spinal Fluid on Meningococcus.**—The main outcome of Shearer's experiments is to show that there is present in normal spinal fluid some substance that greatly increases the rate of growth of the meningococcus on an artificial culture medium. They demonstrate that this power, in the case of human spinal fluid is relatively greater than that shown by blood or nasal secretion; that volume for volume, spinal fluid brings about a much thicker growth of the meningococcus than do the same volumes of blood or nasal secretion.

Annales de Médecine, Paris

July-August, IV, No. 4, pp. 377-472

36 *Disordered Action of the Heart and Military Service. H. Vaquez and E. Donzelot.—p. 377.
37 Paratyphoid Fevers. G. Etienne.—p. 391.
38 Tumor of the Cerebellopontine Angle with Paroxysmal Syncopal Bradycardia. J. A. Sicard and H. Roger.—p. 418.
39 *Remote Sequels of Pleural Effusions. M. Péhu and M. Daguet. —p. 428.
40 *The Proteolytic Power of Normal Polynuclear Leukocytes. N. Fiessinger and R. Clogne.—p. 445.
41 Hemiplegia from Concussion of the Spinal Cord. G. Roussy and J. Lhermitte.—p. 458.

36. **Testing the Heart.**—Vaquez and Donzelot refer to tests for military service, emphasizing that the usual tests do not take into account all of the four main factors in the acceleration of the pulse after a test running or stair-climbing exercise. The irritation of the accelerating nervous system, the reduction in the peripheral resistance, the hampering of the diastole and hence the incomplete filling of the ventricles, cooperate with the hampering of the systole to modify the pulse, but only the difficulty with the systole is directly connected with the force exerted by the myocardium itself. In their examination of hundreds of men in the last few months they were impressed by the extreme variety of the tracings in different persons and at different times in the same person. Also with the frequent contradiction between the tracings which seemed to give most favorable testimony and the unmistakable grave clinical symptoms in certain cases. It seemed impossible to determine any definite relations between the different types of tracings and curves and the functional capacity of the heart. They discuss each type of curve in turn, their conclusions being that the only way to estimate the reserve force of the heart and hence its functional value is to make a careful clinical examination in each case, completed by sphygmomanometry and radioscopy. The men with well compensated mitral or aortic incompetency can be passed for merely the auxiliary service (light duty); as also those with pericarditis with merely localized adhesions. All other forms of cardiac or aortic lesions justify exemption. With functional cardio-pulmonary trouble, the right heart intact, light duty only. In regard to arrhythmia, they state that breathing arrhythmia is not pathologic. With extrasystolic arrhythmia, young men should be passed for full military service with progressive exercise, but older men should be passed only for the auxiliary service or should be exempted, according to the size of the heart. With paroxysmal tachycardia without valvular lesion, the men should be given a rest in a hospital at the front with convalescence leave. With tachycardia in general, the man should be kept in bed for three or four days and then reexamined from time to time. If the tachycardia subsides under repose, progressive exercises are then in order.

39. **Sequels of Pleural Effusions.**—From clinical and radioscopic study of 152 cases of traumatic and spontaneous disease of the pleura, Péhu and Daguet state that months and years afterward there was extensive adhesion of the sheets of the pleura, over extensive areas, only in the cases of pleurisy of tuberculous origin. In all the other cases the adhesions were slight or transient as a rule, including the cases with simple hemothorax after a war wound. Extensive hemothorax persisting after several punctures is liable to produce symphysis between the sheets of the pleura, the same as hemothorax of the dura, as it undergoes organization. Radioscopy reveals the extent of the symphysis and its influence on respiration.

40. **Proteolytic Power of the Leukocytes.**—The proteolytic power of the leukocytes in pus has been well studied, but Fiessinger and Clogne here report what they think is the first extensive research of the kind on the normal polynuclear leukocytes in the blood stream. They found that these leukocytes secrete a protease that has the same action as the protease of the pus leukocytes, an action resembling that of trypsin. The findings are tabulated in detail. They isolated the leukocytes for the purpose by hemolyzing with diluted alcohol and centrifuging.

Archives Médicales Belges, Paris

May, LXX, No. 5, pp. 385-480

42 *Rigidity of Abdominal Wall with War Wounds. C. Willems.—p. 385.
43 *Mental Derangement in Soldiers. H. Hoven.—p. 395.
44 *Local Medication in Treatment of Diphtheria Bacilli Carriers. J. Roskam.—p. 406.
45 Direct Shell Shock of the Nearest Eye. G. Leplat.—p. 412.
46 Present Status of Treatment of Fractures. Stassen and J. Voncken.—p. 416.

42. **Rigidity of the Abdominal Wall with War Wounds.**—Willems expatiates on the importance of determining the presence and degree of rigidity of the abdominal wall in

case of wounds anywhere on the trunk. Even with wounds on the limbs near the trunk, we may overlook important information if we neglect to determine the condition of the abdominal walls. The rigidity may be partial, localized, or there may not be absolute rigidity. With much hemorrhage in the abdomen, the rigidity is general and pronounced; with hemorrhage in the thorax there is also a certain amount of rigidity even when the diaphragm is intact, as also with retroperitoneal lumbar hemorrhage with or without injury of the kidney. The peritoneum is not inflamed, but it is pushed out of its normal place by the accumulation of blood forcing down the diaphragm or in the lumbar region, hence the muscle over it contracts but not so taut as with peritonitis.

When the peritonitis reaches the stage of sepsis, the abdominal wall relaxes. This is liable to be misleading when the patient with a lesion of some hollow viscus is not seen until the rigidity at first has subsided into the stage of relaxation. In some persons the wall is less board-like than in others, and the rigidity is much less pronounced with simple hemorrhage than with perforation of one of the viscera. Small intraperitoneal hemorrhages do not induce rigidity until considerable blood has accumulated, and then only the muscle wall in this region contracts. With a war wound in the liver, there is no rigidity as the blood flows a little at a time. It settles in the right flank; and when enough has accumulated there is rigidity, but only in the right flank. The wound in the liver may be small and heal spontaneously, but the "wooden abdomen" always calls for a laparotomy. With a rapidly developing hemothorax, that side of the abdominal wall stiffens, especially the upper part, and the assumption that the projectile has entered the abdomen seems justified. But by waiting a little, keeping the man quiet, we find the rigidity less pronounced by the next day and all gone in a few days. This unilateral rigidity of the abdomen has led to many unnecessary and futile laparotomies. With a wound of the kidney, the rigidity is likewise unilateral, and some part of the wall on the other side can always be found normal. If the hematuria is not menacing, repose may be all that is needed; otherwise the kidney should be removed from the rear. The abdomen should not be opened for unilateral rigidity. The kidney often is wounded with the peritoneum still intact. With wounds in the pelvis region alone, the rigidity is localized in the vicinity and subsides in a few hours. The partial, localized rigidity only renders more significant the necessity for a prompt laparotomy when the whole abdominal wall is rigid. As Willems expresses it, *grande défense* calls for intervention, and *petite défense* for abstention.

43. **War Psychoses.**—Hoven's conclusion from 300 cases are that the psychoses encountered in the men at the front are the same old types known during the days of peace.

44. **Local Treatment of Diphtheria Bacilli Carriers.**—Roskam reports that local treatment of the throat with iodin and other antiseptics did not clear the throat of bacilli by any means as effectually as when they were treated by insufflation of pulverized antitoxin. With the latter the carrier period was shortened by 33 per cent. in the convalescents from diphtheria and by 59 per cent. in the healthy carriers. The antiseptic group included 53 convalescents and 28 healthy carriers; the antiserum powder group 49 convalescents and 65 healthy carriers. In this last group all but 4 of the convalescents lost their bacilli on an average before the twenty-second day; all but two of the carriers before the nineteenth day.

Journal de Médecine de Bordeaux

October, LXXXVIII, No. 11, pp. 219-236

47 *Reeducation of Disabled Soldiers. Le Dantec.—p. 219.
48 *Pneumonia in Prison Camp. H. Mallié.—p. 224.
49 Syphilophobia after Infection as a Danger for Society. W. Dubreuilh.—p. 228.
50 The Oscillometer as Guide in Venesection. A. Guérin.—p. 230.

47. **Autoreeducation of Disabled Soldiers.**—Le Dantec has noticed that the men overcome their disability with exceptional ease when the training combines simultaneously both active and passive movements. For example, with total hysteric paralysis of the arm, he takes up one finger, stretches it at the word "One" and flexes it at "Two," repeating this five or six times, the patient exerting his will at the same time to the utmost to extend or flex the finger at the word of command. He does the exercise first on the sound hand, the volitional and the passive movement exactly synchronous, until he gradually reduces the passive force to zero. In the same way, on the disabled hand, after five or six repetitions, there can generally be seen a suggestion of volitional movement in the finger. Each finger and finally the hand and the arm are thus exercised separately. The thumb and big toe usually regain spontaneous movement first with this "conjugated bipolar training," as he calls it. Neither the will alone nor the passive movement alone can accomplish this rearousing of function, but the cumulative action of the two combined is proving very successful in his service. He first softens the tissues by soaking in tepid water and massages with greased or soaped hands. Progress is hastened when the man is taught to do the passive movements himself with the sound hand. This gives a zest to the exercises as volitional control is regained, and the man keeps himself busy repeating these auto-exercises. In his service the men sit at a long, covered table and rest the bare arm on it. They stand when the shoulder is being exercised, and sit with bare legs when the paralysis to be combated is in the leg. As soon as spontaneous movements are possible, the men can be allowed to go home, continuing their exercises at home, returning every three weeks to report progress.

48. **Pneumonia in Prison Camp.**—Mallié relates that in the Alten-Grabow prison camp (Prussia) in the course of eleven months there were 244 cases of frank pneumonia with ten deaths among 1,200 French and Belgian prisoners of war, and 116 cases with eleven deaths among an equal number of Russian prisoners. In describing these experiences with pneumonia in the debilitated war prisoners, he emphasizes that pneumonia damages the pleura much more than is generally recognized, thus predisposing it to invasion by the tubercle bacillus. Courses of tonics and respiratory exercises should always follow pneumonia.

Paris Médical

October 20, VII, No. 42, pp. 305-336

51 *Ambard's Urea Constant in Surgery. F. Legueu and H. Chabanier.—p. 305.
52 *Deceptive Decrease in Uremia. J. Castaigne.—p. 308.
53 Glycosuria in the Wounded. F. Rathery.—p. 312.
54 Nongonorrheal Urethritis plus Epididymitis. L. Ramond.—p. 317.
55 Sphincter Disturbance in Connection with Injury of Lumbar-Sacral Region. F. Cathelin.—p. 319.
56 Surgical Importance of Ureter Anomalies. E. Papin.—p. 323.
57 War Nephritis and Albuminuria. Boulangier.—p. 327.
58 Essential Incontinence of Urine. Uteau, Schwab and J. Raton.—p. 328.
59 Secondary Aseptic Hematuria. E. Roucayrol and L. Bovier.—p. 332.

51. **The Urea Constant in Surgery.**—Legueu and Chabanier reiterate that the unfavorable outcome of many an operative intervention might have been foreseen if more attention had been paid to the functional capacity of the kidneys before attempting it. Aside from acute postoperative nephritis—which we have no means of foreseeing—we are able to determine the urea-secretory constant and maximal concentration, and thus obtain insight into conditions that warn of impending postoperative uremia. The danger from this, they explain, depends on the postoperative oliguria. Where the oliguria is not intense and does not keep up long, the uremia does not reach a menacing degree. Ambard's constant is a reliable index, they say, of the functional value of the kidneys from the surgeon's standpoint. It reveals the reserve functional power of these organs, and the surgeon is thus able to compare it with the task he is about to inflict on them, weighing along with it the general condition and degree of infection. It may warn to postpone the intervention until the patient is better able to stand it, or to operate under regional rather than general anesthesia.

52. **Deceptive Subsidence of Uremia.**—Castaigne calls attention to the misleading findings in chronic nephritis with a tendency to uremia when hydremia develops. The blood find-

ings suggest that the urea content of the blood is approaching normal once more, but this is deceptive. The change is due to more water in the blood diluting the urea, while the absolute amount in the circulating blood is the same or higher. In one of several cases reported, the hydremia was the result of a long course of mineral waters. In another, the hydremia followed return to salt in the food after restrictions on account of retention of nitrogen and sodium chlorid. The man of 34 died in coma in three months. The urea content of the blood was only 0.5 gm., but the reds numbered only 2,600,000, testifying to the hydremia which masked the uremia.

Presse Médicale, Paris

October 8, XXV, No. 56, pp. 577-588

60 *Bone Growth From Bone Flap in Skull. J. A. Sicard, C. Dambrin and H. Roger.—p. 577.
61 Syndrome from Tumor in Third Ventriele. A. Salmon (Florence). —p. 578.
62 Auscultation of the Pulse. J. Cottet.—p. 579.
63 Bone Fistulas after War Wounds. Haller.—p. 581.
64 Adjustable Clamp for Fractured Bone. A. Chalier.—p. 585.

October 11, No. 57, pp. 589-596

65 The Bread Question. R. Legendre.—p. 589.
66 *The Laws on Industrial Accidents and War Wounds. L. Imbert. —p. 591.
67 Technic for Operations on the Calf. H. de Gaulejac.—p. 595.

60. **Bone Flap for Skull Defect.**—Sicard and his co-workers report forty-two cases in which they implanted a plate of bone from a skull to close a gap in the skull. The inner surface of the sheet of bone is scraped down to the diploic tissue and is fenestrated. It is then fitted over the gap like a watch glass, between the periosteum and the bone all around the gap. In three cases the plate had to be removed, and it was found that it had stimulated bone production until the gap was well on the way to being permanently closed by a new formation of bone. The findings show that the new growth is the work of the periosteum taking up from the dead bone the material it needs. This exaggerated osteogenetic power conferred on the periosteum testifies to the superiority of a bone flap over metal or other material for the purpose, to say nothing of the perfect tolerance and inexpensiveness of this technic.

66. **Pensions for Effects of Industrial Accidents and War Wounds.**—Imbert discusses the perplexing questions liable to arise when an industrial accident affects a man already damaged by a war wound, or vice versa.

Revue de Médecine, Paris

XXXV, No. 5-6, pp. 281-406

68 *Fat in Chest Wall as Sign of Disease Below. L. Landouzy.—p. 285.
69 *Rôle of the Pancreas in Glycolysis. R. Lépine.—p. 289.
70 Traumatic Neuroses after War Wounds. J. Ferrand.—p. 293. Commenced in No. 4, p. 239.
71 Diagnosis of Sciatica. L. Lortat-Jacob.—p. 314.
72 Delirium of Revindication and Hysteria. R. Benon.—p. 331.
73 The Skin Diseases of War. H. Gougerot.—p. 342. To be continued.

68. **The Adipose Tissue in the Chest as Aid in Diagnosis.**—In this last article from Landouzy's pen, he calls attention to the extra fat in the chest wall liable to be encountered over an old or active pleural or pulmonary lesion. He takes up a fold in the skin as if to apply a seton. The thickness of this fold compared with a symmetrical fold may prove instructive, as the adipose tissue is thicker over the diseased portion. The innervation of the adipose tissue here does not function normally, and the fat does not get oxidized properly. Not being normally oxidized, the fat accumulates. In the cases cited the fold was 13, 18 or 19 mm. thick over the apical lesion in the pectoral region while it measured only 10 mm. on the sound side. In a man of 46, four years after an attack of pleurisy, the chest seemed symmetrical but the calipers showed the fold to be 22 mm. thick over the site of the old pleurisy and only 16 mm. on the other side. In a young man ten weeks after the onset of pleurisy, the overlying fold measured 19 mm. to 10 mm. on the other side.

69. **Pancreatic Diabetes.**—Lépine protests against incriminating the pancreas alone in glycolysis. Certain others of the glands with an internal secretion are unmistakably involved likewise in the glycolysis process.

Correspondenz-Blatt für Schweizer Aerzte, Basel

October 20, XLVII, No. 42, pp. 1393-1424

74 *Indirect Trauma as a Factor in Aneurysms of the Basal Arteries of the Brain. E. Hedinger.—p. 1393.
75 *Errors in Deductions from Presence of Lactic Acid in the Stomach. A. Rodella.—p. 1398.
76 *Concussion and Shell Shock Psychoses. L. Binswanger.—p. 1401.

74. **Trauma and Aneurysms of Basal Arteries.**—Hedinger reports a case similar to that published by Saathoff in which indirect trauma induced rupture and aneurysm in the basal artery of the brain without a trace of inflammatory processes in the vessel wall. His patient was a woman of 47 who had fallen down a flight of steps four years before and had since complained of pains in the back of the neck and head in addition to her preexisting tendency to migraine. She died suddenly and necropsy revealed aneurysm of the vertebral artery with no signs of inflammation. The vertebral and basilar arteries seem to be unusually predisposed to aneurysms. In Hedinger's experience, the Wassermann reaction was always positive in the cases that came to necropsy, the ages between 25 and 40. There is much to sustain the assumption that even slight trauma, such as the forcible stretching of the spine, might damage slightly the posterior cerebral arteries and thus afford a favorable field for colonization by the pale spirochetes.

75. **Lactic Acid in the Stomach.**—Rodella states that the Uffelmann reaction is not specific for lactic acid, but is a group reaction for the group containing citric acid, tartaric, oxalic and succinic acid besides lactic acid. Lactic acid may be found in the stomach content without lactic acid bacilli, and vice versa. He relates further that native albumin, blood or serum, is an indispensable condition for abundant lactic acid fermentation. If there is ulceration or blood in the stomach, there will be profuse production of lactic acid even when the stomach is being emptied normally, provided there is little or no hydrochloric acid present. Time must be given for the fermentation; the findings in less than three quarters or a full hour are misleading. Microscopic discovery of lactic acid bacilli is much more reliable than determination of lactic acid alone.

76. **Concussion Psychoses.**—Binswanger analyzes some of the cases of shell shock psychoses in disabled soldiers interned in Switzerland. In the small group studied all the men had had wounds of the frontal lobe. Some required two operations, and they developed psychoses of a different type after each.

Riforma Medica, Naples

October 20, XXXIII, No. 42, pp. 993-1012

77 *Pathogenesis of Paralysis or Contracture after War Wounds. A. Salmon.—p. 993.
78 Introduction of Antimony into Treatment of Internal Leishmaniosis. R. Jemma.—p. 1007.

77. **Pathogenesis of Paralysis and Contracture.**—Salmon reviews the recent publications of neurologists in this field, and insists on the importance of prolonged immobilization in perpetuating the tendency to paralysis and contracture. He does not admit, however, that this alone is responsible for them. It cannot explain the special vasomotor instability nor the lively reactions on the part of the nerve centers. This vasomotor instability in the region of traumatic neuroses of the hysteria type is too often overlooked. Among the examples cited is the case of a soldier who has had hysteric tremor in the right leg since a war wound. The tremor comes on every time the leg is examined and it becomes actual clonus at the slightest bending of the foot. Along with this there is pronounced dermographism and the skin grows as red as in measles, all coming on and subsiding with the tremor in the leg. The direct connection between the vasomotor phenomena and the hysteric is thus plainly evident. There are many cases on record of simulation of paresis or contracture in which hysteria intervened and rendered it permanent. As he remarks, "the hysteric simulate with the complicity of their organism, and they are left victims of their intent to deceive." Psychotherapy alone is ineffectual

unless supplemented by massage, passive and active exercises, etc. The great obstacle to recovery is the apathy or direct disinclination for recovery. Moral suasion may rouse the men to help themselves get well, threat of punishment, or loss of pension if the physician's efforts are not seconded. With such psychic and physical revulsion excellent results may be obtained. The main point is to begin treatment early and vigorously and not allow immobilization to be kept up too long.

Cronica Medica, Lima

September, XXXIV, No. 651, pp. 311-354

79 *Trypanosoma Duttoni in Lima Mice. R. E. Ribeyro and J. L. Raffo.—p. 313.
80 *Hyperchlorhydria of Biliary Origin. A. Robles.—p. 316.
81 Case of Blue Disease. E. Odriozola.—p. 320.
82 Protozoa in Human Pathology. J. Arce.—p. 324.
83 Present Status of Leishmaniosis. E. Escomel.—p. 334. To be continued.

79. **Trypanosomes at Lima.**—Ribeyro and Raffo report that they found the *Trypanosoma duttoni* in three mice out of a hundred examined. The infected mice came from different houses.

80. **Hyperchlorhydria from Biliary Trouble.**—Robles agrees with Pauchet's recent statement that, on an average, of every ten persons with gastric disturbance, in nine the dyspepsia is of reflex origin, the actual source of the trouble being located outside of the stomach. He reports some typical cases in which everything seemed to indicate stenosis of the pylorus or cancer of the stomach until the whole set of symptoms subsided under medical or surgical treatment of a liver abscess or gallstones, or sluggish liver functioning. In one case nothing could be found at first to explain the gastric pains and other symptoms of hyperchlorhydria from which the woman had suffered for four years. Finally palpation was done as she stood erect. This revealed a tender point in the biliary apparatus which could not be palpated when she reclined. Under treatment to stimulate the production and flow of bile, complete recovery soon followed. Unless bile is being normally secreted and passed along, the pancreatic juice does not get the stimulus which insures its passing into the stomach after a meal. This leaves the gastric secretion in its full strength, not neutralized as normally by the strongly alkaline pancreatic juice. The normal interplay between these three secretions is thus interrupted, and the hydrochloric acid in the stomach exerts an abnormal corroding action. This explanation fits a certain proportion of cases of hyperchlorhydria, and the biliary apparatus should be definitely excluded before incriminating other factors.

Prensa Medica Argentina, Buenos Aires

September 20, IV, No. 11, pp. 133-144

84 Bothriocephalus Found in Jaguar and Wildcat. S. E. Parodi and V. Widakowich.—p. 139.
85 *Tuberculous Process in Submaxillary Gland. J. C. Landaburu. —p. 140.
86 Action of Curare on the Myocardium of Different Species of Frogs. J. Guglielmetti.—p. 141.

September 30, No. 12, pp. 145-160

87 *Normal Beef Serum in Treatment of Anthrax in Man. J. Penna, J. B. Cuenca and R. Kraus.—p. 147. Continuation.
88 *Action of Animal Charcoal on Extracts of Organs. B. A. Houssay. —p. 151.

85. **Tuberculous Process in Submaxillary Gland.**—Landaburu knows of only two cases on record of what he calls bacillary submaxillaritis, but two have been encountered in Vigas' service among 22,000 patients. He gives the microscopic findings in a case in a girl of 14. No tubercle bacilli were found in the giant cells of the tumor after its removal, but the findings otherwise were typical.

87. **Normal Beef Serum in Treatment of Anthrax.**—In this third communication on this subject, Kraus and his co-workers give illustrated descriptions of some of the seventy-eight cases of their latest series of cases of anthrax subsiding under the subcutaneous injection of from 10 to 50 c.c. of normal beef serum.

88. **Adsorption by Animal Charcoal of Active Principles of Organ Extracts.**—Houssay relates that the active principles of pituitary extracts, epinephrin, etc., are adsorbed by animal charcoal and cannot be recovered from it with cold or hot water or glycerin. Scorpion and snake venom are adsorbed in the same way, and talcum, kaolin, etc., display similar absorbing properties.

Revista de la Asociacion Medica, Argentina

September, XXVII, No. 154, pp. 225-406

89 *Graft of Epiphysis of the Humerus. G. B. Arana.—p. 225.
90 *Injections of Boiling Water into the Thyroid. A. Ceballos and G. Bacigalupo.—p. 236.
91 *Perfotation of the Uterus. C. R. Cirio and D. Leiva.—p. 249.
92 History of Public Hygiene in Argentina. E. R. Coni.—p. 268. Continuation.
93 The Mineral Springs of Argentina. E. H. Ducloux and P. Belou. —p. 331.
94 *Synovial Cysts. R. Finochietto.—p. 364.
95 *Normal Beef Serum in Treatment of Anthrax. J. Ligniéres.—p. 370.
96 *American Leishmaniosis. H. Quintana and J. B. Etcheverry.—p. 382.

89. **Grafted Epiphysis of the Humerus.**—Arana's patient was a young man who had fractured the surgical neck of the humerus in a fall from a horse. The extremity of the humerus was taken out and wrapped in gauze during the surgical clearing out of the region. The epiphysis was then restored to place, the lower stump fitting into the lower end of the ingrafted epiphysis. The bed for the lower stump was hollowed out as the epiphysis lay on the table. It was then fitted on the exposed and projecting shaft, and the whole was reduced and the capsule sutured. Roentgenograms taken at intervals since show production of new tissue in a most satisfactory manner. The young man has the practically free use of his arm; only abduction is limited, and this is constantly growing better.

90. **Boiling Water Injections in Local Treatment of Exophthalmic Goiter.**—Six cases of exophthalmic goiter are reported in which the women, from 18 to 52 years old, were treated by systematic injections of boiling water into the goiter according to Porter's technic. Each one was materially improved, the symptoms becoming much attenuated or disappearing altogether. The earning capacity in each was restored, and none of the symptoms have returned during the months to date. The writers do not venture to speak of a complete cure, but they declare that at least with this simple means it is possible to induce material improvement. Some of their patients were given this boiling water treatment to prepare them for thyroidectomy, but the improvement was such that further intervention did not seem necessary. The microscopic findings are given in one case in which part of the gland was excised later. They show that the boiling water had accomplished its purpose, inducing sclerosis and proliferation of connective tissue with destruction of the glandular tissue. Some of the patients were given up to thirty injections.

91. **Perforation of the Uterus.**—Cirio and Leiva analyze five cases, showing the especially susceptible regions of the uterus and the indications for treatment. In one of their cases the perforation was not suspected until the fluid with which the uterus was being rinsed failed to return. In this and similar cases they proceeded at once to posterior colpotomy which permitted evacuation of blood and other fluids and ample drainage. When there is suspicion of injury of the intestine or omentum, a laparotomy is indispensable. Their patients all promptly recovered except in the one case of perforation from criminal auto-abortion.

94. **Synovial Cysts.**—Finochietto relates that recurrence of synovial or parasynovial cysts is disappointingly frequent whatever technic has been used in treating them, and he attributes it to the technic generally used, namely, ligation of the assumed pedicle of the cyst. In reality these cysts do not have a pedicle. The secreting inner surface of the cyst can be removed, with all its prolongations and extensions, in one piece if done with care. What is supposed to be the pedicle is merely adhesions which can be cut or broken without injury to the subjacent tissues. Puncture alone may be sufficient to cure in certain cases. In order to liquefy the contents, he injects 0.5 c.c. of solution of potassium hydroxid when the contents cannot be aspirated readily. He then

aspirates the contents with a broad needle; then injects more of the solution and aspirates anew, until finally convinced he has cleared out the cyst completely. The caustic solution must be introduced very cautiously so that none gets into the tissues around. He uses two needles, introduced on opposite sides of the cyst, the finer needle for the caustic solution, the coarse needle for the evacuation. When this aspiration alone does not cure the cyst, he injects some caustic to destroy the secreting lining, and has found very useful for this purpose a mixture recommended for hemorrhoids, namely, 8 gm. phenol; 4 gm. sodium biborate; 2 gm. salicylic acid, and 30 gm. sterilized glycerin. The first injection should not be more than 0.5 c.c. to see how the tissues stand it. Extirpation of the cyst is the last resort when all these measures fail.

95. **Normal Beef Serum in Treatment of Anthrax.**—Ligniéres has been unable to confirm the assertions of Kraus and Penna in regard to the curative action of normal beef serum in treatment of anthrax. He reports extensive experiments, all apparently proving his contention that the others have been misled in their statements as to its efficacy. One of his arguments is the prevalence of natural anthrax in cattle; if their serum possessed any natural defensive properties it would seem as if their serum would protect them against the disease. He asserts that if normal beef serum had a therapeutic action in Kraus' experiments and clinical experiences, a prepared immune serum would have been correspondingly more effectual.

96. **American Leishmaniosis.**—Quintana and Etcheverry state that two years ago they encountered a peculiar ulcerating affection of the shoulder in a man. It was revealed by the microscope to be the work of Leishman bodies. A few months ago in the Tucuman district the first case of leishmaniosis was diagnosed. Since then a number of cases have been differentiated. They give illustrated descriptions of ten cases, and expatiate on the prompt and effectual action of antimony and potassium tartrate in treatment. The primary lesion is always said to be some small irritation, such as might well have been caused by the bite of an insect, as it is always on exposed portions of the skin. They emphasize the points which distinguish the leishmania from syphilitic lesions with which it might easily be confused, especially as it is not always possible to find the Leishman bodies in the lesions at the time of examination.

Revista de Medicina y Cirugia, Havana

October, XXII, No. 19, pp. 505-532

97 *Pyelonephritis of Pregnancy. L. F. R. Molina.—p. 505.

97. **Pyelonephritis of Pregnancy.**—Molina credits to Rayer of Paris, 1841, the first description of the pathologic relations of pyelitis with the enlarging uterus. Albarran advocated catheterization of the ureters and rinsing out the kidney pelvis when conditions did not right themselves at once after delivery. Widal and Achard in 1912 cultivated from the blood the same germ found in the urine. Molina has found in several cases that the women had had similar attacks in former pregnancies. The colon bacillus is generally responsible for them, some obstruction in the intestine rendering the walls temporarily permeable for the colon bacillus. The pyelonephritis of parturients is usually traceable to the streptococcus or staphylococcus. In the first of the five cases reported, the high fever, severe pain in the right lumbar region, spreading forward, and the vomiting, nearly all completely subsided after catheterization of the right ureter. Nearly three weeks later the same symptoms returned as severe as before, and this time it proved impossible to introduce the catheter and a twin miscarriage soon followed. The ureter had evidently been compressed by the gravid uterus. This assumption of compression of the ureter is confirmed by a case related in which the woman supposed herself at the sixth month of her fourth pregnancy when the symptoms of left pyelonephritis developed suddenly with anuria. Catheterization of the ureter arrested the symptoms but they returned in a few days, yielding anew to the catheter. At the third recurrence, catheterization was impossible. The assumption of a pregnancy was disproved and a laparotomy disclosed a sarcoma in the broad ligament.

This nonpregnancy case was the only one of the five reported in which the disturbance was on the left side. The case shows further that a tumor can induce pyelonephritis from mere compression of the ureter without involving it in the growth. The other three cases were in parturients and all were clinically cured at once by catheterization of the ureter, leaving the catheter in place for one or twenty-four hours. He mentions that urine is not found in the ureter in these cases of assumed compression. The catheter has to enter the kidney pelvis before it reaches urine; this seems to sustain Marion's theory that the ureter yields and slides aside before the enlarging uterus or tumor and its direct compression is not possible. Molina compares further the clinical pictures of puerperal fever and of pyelonephritis. With the latter the temperature generally runs up suddenly quite high with morning remissions and there may be chills, but the general condition keeps good except for the symptoms from habitual constipation and the constant albuminuria.

Semana Medica, Buenos Aires

September 13, XXIV, No. 37, pp. 303-328

98 *Helminthiasis in Buenos Aires. S. E. Parodi and V. Widakowich.—p. 303.
99 The Public Hospitals, etc., of Buenos Aires. E. R. Coni.—p. 309. Continuation.
100 *Identification of Novocain. J. A. Sanchez.—p. 319.
101 Chronic Occlusion of the Intestines by Adhesions from Hernia. H. De Cusatis and E. de Grossi.—p. 321.
102 Relations between Radium and Phosphorus. V. F. de Courmelles.—p. 323.

98. **Helminthiasis at Buenos Aires.**—Parodi and Widakowich report that among 300 hospital patients, 74 per cent. of the children and over 54 per cent. of the adults were found harboring helminths. There was more than one variety in over 28 per cent. of the children and over 14 per cent. of the adults. No symptoms from them were apparent in most of the cases, but it is evident that neglect to examine for helminths is responsible for the difficulty in clearing up the diagnosis in many cases.

100. **Tests for Novocain.**—Sanchez is professor of analytic chemistry at the University of Buenos Aires. He describes a number of means to identify novocain, and to estimate the purity of a specimen. He determines the latter by dropping a 0.2 per cent. solution of the novocain into a solution of 0.8 gm. bromin in 1,000 c.c. water. When pure, the novocain solution decolors a certain volume of the bromin solution.

Russkiy Vrach, Petrograd

June 17, XVI, No. 21-24, pp. 409-432

103 *Special Form of Milk Powder in Infant Feeding. N. R. Blumenau and O. M. Petipa.—p. 409.
104 *Pituitary Extract in Treatment of Incontinence of Urine. N. A. Mikhailoff.—p. 417.
105 Civilization and Medicine in Ancient Assyria and Babylon. P. V. Modestoff.—p. 418. Conclusion.
106 The Ferments in Typhoid. A. S. Solovtzovoi.—p. 423. Conclusion.
107 Morbidity in Army in Tarnopol District. V. R. Russatie.—p. 425. To be continued.
108 Experiences with Skull Wounds at Evacuation Hospital. V. P. Diedoff.—p. 429. To be continued.

103. **"Albumin Phosphate" in Infant Feeding.**—This is the name given by Danilevsky in 1901 to the precipitate thrown down when milk whey is treated with ammonia. It takes about a gallon of fresh pure milk to make 40 gm. of the "albumin phosphate."

104. **Pituitary Extract in Treatment of Incontinence of Urine.**—Mikhailoff reports nineteen cases of nocturnal incontinence in children and adults in which prompt benefit followed treatment with pituitary extract in some form. This seems to have an elective contracting influence on unstriped muscle fibers and, as the bladder sphincter is composed of unstriped muscle fibers, a favorable influence on incontinence of urine might be anticipated from its action. The success surpassed his highest anticipations. All the patients were relieved of their incontinence, including ten children who had no other known anomaly, a few young men who had incontinence both day and night, and five or six men of 38 to 42 with exclusively nocturnal incontinence. One man of 28 had been unable to retain his urine at night since the age of 16.

Nothing decidedly pathologic could be discovered in the urogenital organs. After four weekly injections of the pituitary extract he was able to retain his urine at night. The patients have been under observation for three or four months and there has been no recurrence of the incontinence to date in any of them. Mikhailoff does not wait for more extensive experience but hastens to call attention to this harmless and effectual means of relieving young and old from nocturnal incontinence. Time alone will show whether the results will be permanent.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

September 15, II, No. 11, pp. 927-1022

109 The Importance of Experiments on Living Animals for the Progress of Science. (Voor en tegen proeven op levende dieren. IV.) G. van Rijnberk.—p. 927.
110 *The Diagnostic Tuberculin Reaction. R. P. van de Kasteele.—p. 948.
111 *Simple versus Combined Drugs. W. S. van Leeuwen.—p. 957.
112 *Diagnosis and Treatment of Epidemic Cerebrospinal Meningitis. F. J. Hagen.—p. 963.
113 Lack of Compensating Pause in Ventricle Beat of Frog Heart. S. de Boer.—p. 971.
114 *Recovery of Two Children from Meningococcus Meningitis. A. Schoondermark.—p. 976.

110. **Tuberculin Reaction in Diagnosis and Treatment.**—Van de Kasteele presents arguments to show that as the skin plays a very active part in the diagnosis of tuberculosis, it probably aids proportionately in the treatment of tuberculosis when the tuberculin is given intradermally. He points to the rarity of serious forms of tuberculosis in children with tuberculous lesions of the skin. The skin foci seem to immunize the child against severe general infection. Wichmann has reported a case in which pulmonary and laryngeal tuberculous lesions subsided and the patient recovered after lupus developed, consecutive to a tracheotomy. It is possible that from the local focus which we make with our injection of tuberculin, antibodies are generated and thrown out into the circulation. The absorption from this focus of toxic substances which might injure the primary tuberculous focus is probably prevented by their destruction at the point where they are produced.

111. **Mixing of Drugs.**—Van Leeuwen writes from the Pharmacology Institute at Utrecht to protest against recent publications by Bürgi and others to the effect that the potential energy of certain drugs can be enhanced by combining them. Practical experience to date has not confirmed their theoretical premises, he says.

112. **Epidemic Meningitis.**—Hagen relates that lumbar puncture gave positive findings long before there was a tendency to stiffness of the neck in the cases in his service. Whenever it appeared the patient had been sick for some time. Even when the cerebrospinal fluid is found sterile, the petechiae in the skin suggested the correct diagnosis. Even more characteristic are lead colored spots between the petechiae or alone. These in his experience always heralded meningococcus infection even when there were no signs of meningitis or the spinal fluid was sterile. They are too large for hemorrhagic petechiae. The meningococcus was found in the blood in one case with sterile spinal puncture fluid. The trouble begins with sepsis, and only later does the infection settle on the meninges. He does not hesitate to start serotherapy at once when a man evidently acutely sick develops these lead blue spots even although the lumbar puncture fluid is still sterile. In treatment he draws from 30 to 50 c.c. of spinal fluid and injects 20 c.c. of the antiserum the first three or four days. In one case he repeated the injection the same day. In case the turbid fluid does not flow freely, he makes the injection subcutaneously. Six of the men succumbed. In two of them pus was found in the right frontal sinus besides the purulent meningitis.

114. **Meningococcus Meningitis.**—The ages were 2 years and 4 months in Schoondermark's two cases in children. Meningococci were found in the lumbar puncture fluid and the antiserum was pushed, seven intraspinal injections being given, about 6 or 8 c.c. at a time. No benefit was apparent for some days, but then the children recuperated and recovered completely with no sequelae.

Hospitalstidende, Copenhagen

September 26, LX, No. 39, pp. 933-972

115 *Carbon Dioxid Snow in Treatment of Xeroderma Pigmentosum. S. Lomholt.—p. 933.

115. **Carbon Dioxide Snow in Treatment of Pigmented Xeroderma.**—The illustrations before and after show marked benefit from the treatment with carbon dioxid snow in the case of the young woman reported by Lomholt. The reaction to the freezing was so intense that the application could be for only ten seconds at a time. The new skin that formed under it was nearly or entirely free from pigmentation, the change more pronounced, he says, than is apparent in the illustrations.

Ugeskrift for Læger, Copenhagen

September 20, LXXIX, No. 38, pp. 1565-1606

116 *Colon Bacillus Otitis. R. Lund.—p. 1565.

September 27, No. 39, pp. 1607-1644

117 Intraspinal Salvarsan Therapy. C. With.—p. 1607.

October 4, No. 40, pp. 1645-1670

118 *Scarlet Fever and Milk. A. Djørup.—p. 1645.

116. **Colon Bacillus Otitis.**—Lund states that at the clinic for ear and throat disease at Copenhagen during the last ten years 569 simple mastoid operations were done, and in 372 with the middle ear operation beside. Bacteriologic examination in 306 cases showed the colon bacillus in 12, dubious in 5 additional cases. In 2 of the 12 cases there was merely mastoid suppuration, but in the 10 others there were serious complications, mostly intracranial and multiple. The 7 cases with thrombophlebitis showed infarcts in the lung in 3 and gangrene in 2, while there was one instance each of metastatic pyothorax, pleural empyema, pneumonia, pericarditis and peritonitis. There was a mastoid abscess only in 5 of the total 12 cases, but an epidural abscess was found in 9. Diffuse purulent meningitis was encountered in 5 of the 12 cases and colon bacilli were found in the fluid in one case on lumbar puncture. The colon bacillus infection seemed to occur only as a sequence to old chronic otitis media. The mortality in the 12 cases was about 60 per cent.

118. **Scarlet Fever and Milk.**—Djørup analyzes a recent epidemic of scarlet fever at Copenhagen. One day reports of cases began to come in from all over the town, and the same day it was established that all these families took milk from one milk company. Three of the employees developed scarlet fever that same day. A fourth employee had been taken to the hospital five days before, and now had scarlet fever. This seemed to be the human source, and as he had not been near the milk distributing plant for so many days, there seemed no necessity for closing it. The children's milk was ordered to be pasteurized. But the next day there were forty-five new admissions for scarlet fever, and in five days there were 236 cases notified, and 200 of the patients had taken milk from this one milk company. It was also ascertained that the supposed "human source" had entered the hospital for treatment of a burn, and that the scarlet fever had not developed until the day that the epidemic had "exploded."

The human source was finally found in one of the two dairy farms supplying the company, an immigrant girl who did part of the milking having been sick with scarlet fever for ten days when the epidemic exploded. She had kept at work throughout. This dairy farm had been telephoned to at the first. If the question asked had been "Is there any one at the farm with hives or other eruptions?" the answer would have been in the affirmative. The scarlet fever had not been recognized, no physician having been called in. The milk from this dairy farm was returned and every one on the place was examined by a physician at night and before being allowed to go to work in the morning. In the course of two and a half weeks four persons on the farm were found to have sore throat and they were at once excluded; two of them proved to be coming down with scarlet fever. The epidemic died out the fifth day after milk from this dairy farm had been excluded from the market, the extinction of the epidemic occurring almost as abruptly as the onset. The milk distributing company paid the expense of the investigation. Diarrhea was the first sign of trouble in many of those affected but nephritis was rare. The glands in the neck became enlarged in some, and several children died.